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American Institute of Certified Public Accountants. MAS Task Force on Evaluation of Efficiency and Program Results

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EXPOSURE DRAFT
MAY 1976

GUIDELINES FOR PARTICIPATION IN
GOVERNMENT AUDIT ENGAGEMENTS
TO EVALUATE ECONOMY, EFFICIENCY
AND PROGRAM RESULTS

Prepared by the
MAS TASK FORCE ON EVALUATION
OF EFFICIENCY AND PROGRAM RESULTS

Approved for Prepublication Exposure
by the
MAS EXECUTIVE COMMITTEE

Comments should be submitted by

July 23, 1976

to:

Monroe S. Kuttner, Manager
MAS Division
American Institute of
Certified Public Accountants
1211 Avenue of the Americas
New York, New York 10036

TASK FORCE ON EVALUATION OF EFFICIENCY AND PROGRAM RESULTS

John J. Doyle, Jr., Chairman	Peat, Marwick, Mitchell & Co.
Francis H. Beam	Ernst & Ernst
Donald J. Borut	International City Management Association
William D. Mahaney	Clarence Rainess & Co.
Ellsworth H. Morse, Jr.	U.S. General Accounting Office
Gary C. Roats	Touche Ross & Co.
Michael Simon	Arthur Andersen & Co.
Frank J. Thomason	Haskins & Sells

Monroe S. Kuttner AICPA MAS Division

The task force would like to recognize the contribution of deceased member Richard Yardley (J. K. Lasser & Co.) who participated in the development of this document.

* * * * *

This exposure draft is being distributed for comment to the following persons:

AICPA Council, Board of Directors, and
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mittee Chairmen, and Executive Directors

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GUIDELINES FOR PARTICIPATION IN
GOVERNMENT AUDIT ENGAGEMENTS TO EVALUATE ECONOMY,
EFFICIENCY AND PROGRAM RESULTS

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GUIDELINES FOR PARTICIPATION IN
GOVERNMENT AUDIT ENGAGEMENTS TO EVALUATE ECONOMY,
EFFICIENCY AND PROGRAM RESULTS

INTRODUCTION

The issuance in 1972 of the United States Accounting Office's
Standards for the Audits of Governmental Organizations, Programs,
Activities and Functions significantly expanded the meaning of the
word audit when it is to be applied to governmental and government
funded activities. As a result, the CPA engaged to perform a
governmental audit may now be expected to do far more than in the
past. In addition to the traditional examination of financial state-
ments in accordance with generally accepted auditing standards, ex-
panded governmental audits may be concerned with the following
questions:

- Is the entity managing or utilizing its resources in
an economical and efficient manner?
- Is the entity achieving the desired results or benefits?
- Are the entity's operations in compliance with applicable
laws and regulations beyond those relevant to a financial
audit?

The additional audit objectives designated by the GAO may
pose extensive challenges for the practitioner who chooses to con-
duct expanded governmental audits. He will be called upon to use
not only his financial auditing and accounting skills, but a
variety of management advisory services skills as well. He will,
in fact, be conducting audits which will require judgments based
on expertise which may not be available within his staff and which
are normally associated with other professional disciplines, such

as engineering, medicine, social sciences, and public administration. The CPA undertaking such engagements, therefore, should be aware of the potential problems associated with these additional requirements and should understand how existing AICPA standards apply to expanded scope audits.

The purpose of this document is to guide the CPA¹ considering participation in an audit engagement for any entity at the federal, state or local levels to which the GAO audit standards apply. The GAO's document does contain the basic information about the audit standards, but certain ramifications for public accounting firms are not always clear. The standards were written for governmental audit agencies as well as public accounting firms.

Since CPAs will increasingly be engaged to perform audits in accordance with GAO standards, it is essential to understand what may be involved in making a commitment to do so. Unless the CPA is careful to reach an understanding of the scope of such an audit with those who authorize the engagement--and to document that understanding in the engagement agreement--he could easily overextend his available resources or fail to deliver what is expected.

The specific objectives of the chapters which follow are these:

- To give CPA firms and individual practitioners a better understanding of expanded governmental audits and the related knowledge and qualifications they should possess or acquire in undertaking this kind of engagement (Chapter 1).

- To assist CPAs in assessing the desirability and appropriateness of responding to government requests for proposals (RFPs) to conduct such engagements (Chapter 2).
- To explain certain techniques and constraints which may be involved in the conduct of such engagements (Chapter 3).
- To provide illustrations which may be helpful in the development of work programs for economy and efficiency evaluations in such engagements, and to encourage greater consistency in such work programs for selected functional areas (Chapter 4).
- To increase awareness of the continuing developments in the "state of the art" of evaluating program results (effectiveness) (Chapter 5).
- To provide information and examples which may be helpful in preparing reports on non-financial findings and recommendations (Chapter 6).
- To interpret existing AICPA professional standards as they may apply to expanded governmental audits (Chapter 7).

This document does not intend to set standards for governmental engagements to evaluate economy, efficiency and program results. Engagements of this kind, in response to the 1972 GAO standards, are still an evolving area of practice requiring further practical experience by members of the profession. Ultimately, a publication similar to those in the AICPA's audit guide series

should be issued covering governmental economy, efficiency and pro- 1
gram results evaluations as well as financial audits. This publica- 2
tion is designed to provide guidance in the interim period. It ex- 3
amines the GAO standards from the CPA's perspective rather than 4
that of a governmental audit agency. 5

Chapter 1

ELEMENTS OF GOVERNMENTAL AUDITS

In its 1972 publication Standards for Audit of Governmental Organizations, Programs, Activities and Functions, and in subsequent publications, the GAO expanded the use of the term audit to include any one or more of the following elements:

1. An examination, in accordance with generally accepted auditing standards, of accounting records and internal controls--leading to an expression of an opinion on the fairness of the presentation of financial statements in accordance with generally accepted accounting principles (or other specified accounting principles).
2. An evaluation of economy and efficiency relating to operations, administration and management--leading to specific citations of problem areas and, when possible, recommendations for corrections or improvements.
3. An evaluation of program results--leading to a statement of findings regarding the attainment of established objectives of the program or organization, and, when possible, including recommendations for improving effectiveness.

In addition, the GAO specifies that audits of economy, efficiency and program results should also include an examination of whether an entity's operations meet applicable legal and regulatory requirements, thus extending the compliance aspects of a financial audit to non-financial matters. This lengthy definition is indicative of the complexity which a full scope governmental audit, as

defined by the GAO, may entail. Though full scope audits will not
always be required, all concerned should be aware that an audit
in accordance with the GAO standards may entail all of the above
elements unless the engagement agreement clearly limits the work
to be done.

All GAO audit elements were covered briefly in an initial AICPA
report entitled Auditing Standards Established by the GAO: Their
Meaning and Significance for CPAs, published in 1973. That report
encourages accountants to participate in expanded audits, but sug-
gests that much additional work by the profession is needed con-
cerning standards for evaluations of economy, efficiency and
program results. This publication considers the "evaluation"
aspects of expanded scope audits in greater detail. It also dis-
cusses the legal and regulatory requirements aspect of evaluations
of efficiency and program results.

Although the GAO standards assume that an audit may have all
of the expanded audit elements, they do not imply that every audit
must have all of them or that such an extensive scope is always
desirable. Therefore, governmental work defined by the term audit
may vary considerably from engagement to engagement. This accen-
tuates the importance of having a clear understanding as to the
scope of an engagement to which the GAO standards apply and the im-
portance of having an engagement agreement as a medium for document-
ing this understanding. An audit of the broader scope will pre-
sumably require more time; it should provide greater benefits to

the client, but at additional cost.

Some government entities and practitioners who are familiar with the management letters which often accompany financial audits equate the level of work in an expanded scope audit to that required to prepare management letters. This is not correct. Such letters are almost totally a by-product of the work required for the financial audit. The GAO has made it clear that its standards do not refer to such a by-product. Instead, a separate work program is required, specifically designed to examine economy and efficiency or effectiveness (program results), and to produce findings, conclusions and recommendations concerning them. Both the CPA and the client should, therefore, understand that the engagement time and cost will exceed that required for a financial audit alone.

Woven throughout the GAO standards and related publications are references to each aspect of governmental audits included in the expanded definition. Careful reading of these publications is recommended before a firm enters into any audit contract in which the standards are cited. Here, for convenience, are some of the salient and not-so-obvious points covered in the GAO audit standards.

The GAO defines the expanded scope audit elements as follows:

"Economy and Efficiency - determines whether the entity is managing or utilizing its resources (personnel, property, space and so forth) in an economical and efficient manner and the causes of any inefficiencies or uneconomical practices, including inadequacies in management information systems, administrative procedures or organizational structure."

"Program Results - determines whether the desired results 1
or benefits are being achieved, whether the objectives estab- 2
lished by the legislature or other authorizing body are being 3
met, and whether the agency has considered alternatives which 4
might yield desired results at a lower cost." 5

Legal and regulatory requirements not related to the financial 6
audit are identified as follows: 7

"Economy and Efficiency - The auditor is to make a review of 8
the laws and regulations applying to any aspect of the audited 9
organization, program, function, or activity in which he at- 10
tempts to make judgment regarding whether existing practices 11
can be made significantly more efficient or economical. Such 12
a review is needed because determinations of how the entity's 13
tasks can be accomplished more efficiently and economically 14
cannot be done properly without an understanding of the purpose 15
of the entity and what it is legally required to do. Such a 16
review is needed also to provide the auditor with information 17
on constraints on the entity's authority to change its prac- 18
tices to make them more efficient and economical." 19

"Program Results - The auditor is to review the laws and reg- 20
ulations pertaining to the goals and objectives of the audited 21
entity's programs or activities in sufficient depth to gain 22
a working understanding of the results that are expected from 23
the programs or activities. He must also do sufficient test- 24
ing to determine whether the programs or activities are being 26
performed in conformity with applicable laws and regulations." 27

In this document, the financial element of a governmental audit 1
will not be discussed, but the term audit will be used to refer to 2
any engagement to which the GAO standards may apply. The term 3
"evaluation" or "evaluation engagement" will be used when referring to 4
the economy, efficiency and program results elements of an expanded 5
scope audit. 6

Evaluation of Economy and Efficiency 7

In the text reproduced below, the GAO standards booklet 8
identifies the general objectives of an evaluation of efficiency 9
and economy: 10

"A review of efficiency and economy shall include inquiry into 11
whether, in carrying out its responsibilities, the audited 12
entity is giving due consideration to conservation of its 13
resources and minimum expenditures of effort. Examples of 14
uneconomical practices or inefficiencies the auditor should 15
be alert to include: 16

- a. Procedures, whether officially prescribed or merely followed, 17
which are ineffective or more costly than justified. 18
- b. Duplication of effort by employees or between organizational 19
units. 20
- c. Performance of work which serves little or no useful purpose. 21
- d. Inefficient or uneconomical use of equipment. 22
- e. Overstaffing in relation to work to be done. 23
- f. Faulty buying practices and accumulation of unneeded or 24
excess quantities of property, materials, or supplies. 25
- g. Wasteful use of resources." 26

In evaluating economy and efficiency, the practitioner should 1
consider organization, policies, procedures, practices, and inter- 2
nal administrative controls relating to the aspects of the entity's 3
operations being reviewed. However, an extensive review of all 4
such matters would often be prohibitively expensive. The practi- 5
tioner must use his judgment to concentrate his efforts on the 6
problems which appear to have a significant impact in the area being 7
evaluated. He should, for example, devote more of his time to 1) 8
activities which incur high costs; or 2) areas in which preliminary 9
work has indicated that the operations are not being conducted 10
efficiently or economically. While the practitioner should not 11
devote extensive time to operations that appear to be satisfac- 12
tory, neither should he ignore them. He should, for example, men- 13
tion their existence in his report. This will provide evidence of 14
the thoroughness of the review, and by providing balance with un- 15
satisfactory findings, may lessen potential resistance to implemen- 16
tation of recommendations for remedial action. 17

The CPA is not expected to give an opinion on the overall level 18
of efficiency and economy that an organization achieves in using 19
its resources to carry out operations. 20

Evaluation of Program Results (Effectiveness) 21

The purpose of such an evaluation is to determine whether the 22
desired results or benefits are being achieved. Engagements of 23
this kind often appear to be much simpler than they are in fact. 24

Frequently, in government activities, program objectives and 25
measurement criteria are not clearly specified. Until the objec- 26
tives have been identified and documented, an evaluation cannot be 27

meaningful. However, the GAO anticipates that in cases where this has not been done prior to the audit, the CPA may be called upon to counsel with management to: 1) reduce program objectives to writing, 2) establish, where possible, valid measures, and 3) develop the methods for accumulating the information necessary to measure progress in achieving these results. ⁴ An engagement requiring such work can be far more extensive than may at first be apparent.

Prior to submitting a proposal for an engagement, the CPA should attempt to ascertain the extent to which it may be necessary to counsel with management in the areas described above. He may decide not to submit a proposal if he concludes that he lacks appropriate expertise or believes it would not be practical to satisfactorily define goals, establishing measures, etc. If he does plan to counsel with management in these areas, this must be considered in establishing the engagement scope and procedures.

The GAO describes an evaluation of program results in terms as broad as those used for an evaluation of efficiency and economy. It includes a review of operations, policies, practices, controls and compliance requirements which have a specific bearing on the attainment of program goals and objectives.⁵ The practitioner should perform whatever reviews are required to properly assess program results, keeping in mind that the primary assessment of program results is the continuing responsibility of the entity's management. Ideally, the practitioner would only be required to evaluate the data and criteria which formed the basis for management's assessment, and the analytical process through which it was developed, in order to determine if it is reasonable or appropriate. Rather than giving a standard accountant's report with a one or two paragraph opinion, he would then evaluate and report on specific

findings concerning management's assessment of program results and 1
the data gathering and analysis which it involved. In addition, 2
when possible, the practitioner would make recommendations for im- 3
proving program effectiveness based on his observations in the 4
course of evaluating management's reports. 5

While the above represents the ideal situation in an engagement 6
to evaluate program results, often there are cases where management 7
has not made a usable assessment of program results or does not have 8
the data necessary to do so. The CPA may be asked to develop an 9
independent assessment. Before preparing an engagement proposal, 10
therefore, it should be ascertained whether management has developed 11
reports assessing program results. If not, the CPA can then con- 12
sider whether, and under what conditions, he will undertake such 13
work. 14

Legal and Regulatory Requirements 15

This publication considers legal and regulatory requirements 15
for evaluations of economy, efficiency and program results, but not 16
those for financial audits. 17

Legal and regulatory requirements reviews in non-financial 18
areas may require extensive data gathering and can be time consuming 19
and expensive. A substantial part of the work required to identify 20
the applicable laws and regulations should be done by the organiza- 21
tion requesting the evaluation, thus limiting the practitioner's 22
involvement to the exercise of professional judgment in gathering 23
and testing the related data. In practice, the organization may 24
not provide the data on applicable laws and regulations. In such 25

instances, the engagement agreement should specify the CPA's approach. 1
If the effort will be extensive, the CPA should provide sufficient 2
time in the work plan. 3

Practitioner's Qualifications 4

The CPA should keep in mind the following significant distinction 5
between financial auditing and engagements to evaluate efficiency, econ-6
omy, and program results. While there are some variations encountered in 7
conducting financial audits, a practitioner skilled in examining account-8
ing records, financial statements and internal controls should encounter 9
few material differences in the skills and knowledge required of him 10
when moving from one governmental entity to another. This is not true 11
for evaluations of economy, efficiency and effectiveness. While he will 12
apply the same analytical approach, the nature of the problems encount- 13
ered and the knowledge and skills that may be required will be no less 14
diverse than the goals and activities of the federal, state or local 15
governmental entities to be audited. 16

The GAO's second general standard for governmental auditing 17
states that: "The auditors assigned to perform the audit must col- 18
lectively possess adequate professional proficiency for the tasks 19
required."⁷ The GAO's text on their second standard describes such 20
professional proficiency: 21

"Requirements for staffs performing government audits are: 22

1. A basic knowledge of auditing theory and procedures and the 23
education, ability, and experience to apply such knowledge 24
to the type of auditing work required for the task at hand. 25

2. A basic knowledge of governmental organization and operation. 1
This knowledge may be acquired by appropriate education, study, 2
or experience. 3
3. Skills appropriate for the work required in the audit. For 4
auditing financial reports which lead to an opinion, the 5
auditor must be proficient in accounting... 6
For other types of auditing work, the skills of the auditors 7
must be appropriate for the work to be done. For instance: 8
 - a. If the work requires use of statistical techniques, the 9
audit staff must include persons having the appropriate 10
statistical skills. These skills may be possessed by staff 11
members or by consultants to the staff. 12
 - b. If the work requires extensive review of computerized 13
systems, the audit staff must include persons having the 14
appropriate computer skills. These skills may be possessed 15
by staff members or by consultants to the staff. 16
 - c. If the work involves review into complex engineering data, 17
the audit staff must include persons having the appropriate 18
engineering skills. These skills may be possessed by staff 19
members or by consultants to the staff." 20

The GAO's examples could readily have included skills or knowledge re- 21
lated to sociology, psychology, medicine, transportation, public safety, 22
judicial processes, sanitation, etc. Public accounting firms may often 23
have to supplement their staffs to fulfill these requirements. In con- 24
sidering their qualifications for a particular engagement, CPAs 25
should be aware that in certain cases cooperative engagements with 26
other professionals could provide the needed expertise if it is not 27

9
available within their own firm.

Summary

The material covered in this chapter should provide a clearer understanding of the nature of expanded scope governmental audits and of the knowledge and qualifications which CPA firms and practitioners should possess or acquire in undertaking this kind of engagement. The GAO's requirements for an evaluation of economy, efficiency or program results, as the quotes from the standards booklet testify, call upon practitioners to consider many things during an expanded scope audit that have not previously been a matter of concern except in providing management advisory services, or in operational auditing. The CPA must, therefore, before undertaking a governmental audit, assess his own capabilities in terms of what will be required.

Chapter 2

RESPONDING TO A GOVERNMENT REQUEST FOR PROPOSAL (RFP)

For the CPA about to respond to a government request for a 1
proposal involving an evaluation of economy, efficiency or program 2
results, these elements of government audits will require serious 3
consideration. Even those experienced with similar evaluation 4
reviews in the private sector through their MAS practices will need 5
to consider the effects the requirements will have on their govern- 6
mental audit proposals in terms of factors such as work plans and 7
estimated manpower and time requirements. 8

The purpose of this chapter is to assist CPAs in responding to 9
government requests to submit proposals for expanded scope audits. A 10
brief explanation of the procedure generally followed by governmental 11
entities to secure proposals and select an auditor follows. 12

A request for proposal (RFP) is a government's method of assur- 13
ing the required competition for government business--in this case 14
a full scope audit or evaluation engagement. While the format of an 15
RFP may vary widely, it usually states problems, goals and objectives, 16
may provide some specifications on scope, methodology and data 17
sources and generally asks for the respondents' qualifications and 18
proposed approach. The RFPs for federal government engagements will 19
frequently be highly formal, both in nature and in the procedures 20
followed. RFPs from local governments may take the form of simple 21
letters involving few formal procedures, or they may be as complex 22
as federal government RFPs. Usually, any CPA aware of the issuance 23
of an RFP may secure a copy and respond, though in some cases there 24
may be certain restrictions. A formal RFP will indicate the nature 25

of the work to be performed and administrative matters concerning 1
both the submission of the proposal and the conduct of the engage- 2
ment.

Unfortunately, the work statement for an audit--particularly 3
at local levels--may be unclear, and may state only that it involves 4
"performing an audit in accordance with the GAO standards." In such 5
cases, the CPA should obtain clarification of the work required 6
before submitting a proposal. Often there are official conferences 7
where potential respondents may raise such questions. Ideally these 8
conferences will supply answers or alert the CPA to possible prob- 9
lems. Without clarifications, a CPA could submit a proposal for 10
elements of an expanded audit when the issuing entity only desires 11
a financial audit, or vice-versa. The GAO standards do not mandate 12
performance of all elements, but many governmental entities are 13
adopting the expanded audit concept. Both the CPA and the entity 14
requesting the audit proposal should be clear as to what work is 15
required if the proposals are to be responsive and competitive. 16

Since government proposals are often more formal than those 17
used in the private sector, a CPA should adhere to the content and 18
format specifications in the RFP to assure that his proposal will 19
not be rejected for technicalities. Further, a proposal based 20
solely on a subjective interpretation of a vague RFP may be rejected 21
as not responsive to the requester's needs. 22

A proposal should be as specific as possible, not only as to 23
scope, objectives, work program and fee, but also as to billing, 24
reporting, staffing and other pertinent matters. It may be extremely 25
difficult to modify or change conditions of a proposal once it has 26
been accepted. 27

Pre-Engagement Checklist

The following checklist for audits including an evaluation of economy, efficiency or program results has been prepared to: 1) assist CPAs in understanding the nature of each potential engagement; 2) guide those who issue RFPs in providing the desired information; and 3) aid the CPA in structuring a proposal and work program.

The checklist contains a series of questions which fall into four broad categories:

- Engagement environment. The professional relationship between the CPA and the government entity to be evaluated.
- Economy and efficiency. Elements of the engagement that will affect the CPA's proposal.
- Program results. Elements of the engagement that will affect the CPA's proposal.
- Professional proficiency. The CPA's qualifications to undertake a specific engagement.

Pre-Engagement Checklist

A. Engagement Environment

1. Who is requesting the audit?
2. What motivated the request?
3. Will the requester or recipient be able to implement the report recommendations?
4. Are audit objectives and scope of work well defined and attainable?
5. Does the scope entail a constructive piece of work?
6. Is sufficient time allotted for the CPA to complete the engagement?

7. Will the applicable laws and regulations be specified in the audit agreement? 1
8. Will the criteria for selection of an independent firm be based on competence as well as on price? 2

B. Economy and Efficiency 3

1. Is there agreement between the CPA and requester as to which areas are to be reviewed (e.g. programs, departments, activities or projects)? 4
2. Is there a clear understanding of which functional areas are to be reviewed (e.g. personnel utilization, data processing, procurement, financial management, warehousing and inventory management, etc.)? 5
3. Have there been prior reviews (internal or external) of the same area? 6
4. Were any actions taken as a result of prior reviews? 7
5. Will prior reviews be made available to the CPA 8
6. Has the requester specified any existing data and reports which may be accepted as reliable without further verification? 9
7. To what extent does the work to be studied lend itself to measurement? 10
8. Have criteria for measuring economy and efficiency been established (e.g., does the entity have existing productivity standards)? 11
9. Have the data related to the established criteria been accumulated? 12

- | | |
|--|---|
| 10. Will the data be available to the CPA? | 1 |
| 11. Is routine reporting of productivity a current or feasible practice? | 2 |
| | 3 |
| 12. To what extent are cost data available? | 4 |

C. Program Results

- | | |
|--|----|
| 1. Are there well defined program objectives? | 5 |
| | 6 |
| 2. Are there reasonably well defined timetables for achieving program objectives? | 7 |
| | 8 |
| 3. Have criteria been established for evaluation of program results? | 9 |
| | 10 |
| 4. Are the criteria quantified and to what extent can the results be measured objectively? | 11 |
| | 12 |
| 5. Have the data related to the established criteria been accumulated? | 13 |
| | 14 |
| 6. Will the data be available to the CPA? | 15 |
| 7. Has management prepared a current assessment of the program's results? | 16 |
| | 17 |
| 8. Have there been any previous external evaluations of the program? | 18 |
| | 19 |
| 9. Were any actions taken as a result of previous evaluations? | 20 |
| 10. Will previous evaluations be made available to the CPA? | 21 |

D. Professional Proficiency

- | | |
|--|----|
| 1. Is the CPA familiar with the governmental environment | 22 |
| (e.g. source of funding, related agencies, potential | 23 |
| publicity, potential subsequent reviews, etc.)? | 24 |
| | 25 |
| 2. Does the CPA understand the scope of the audit? | 26 |

3. Does the CPA possess or have access to technical skills required to review and evaluate the specific functional areas involved?
4. Does the CPA understand the specific government program and have access to the specific skills needed to evaluate the program results?

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Chapter 3

CONDUCTING EVALUATIONS OF ECONOMY, EFFICIENCY AND PROGRAM RESULTS

The evaluation elements of a governmental audit call upon the practitioner to utilize a variety of skills and to utilize audit procedures which typically are not called for in the examination of financial statements. In financial audits, a CPA follows generally accepted accounting principles and generally accepted auditing standards. For evaluations of economy, efficiency and effectiveness, there are no generally accepted standards that have been adopted by the profession.

The purpose of this chapter is to provide some guidance by indicating the analytical approach which many practitioners consider basic to the conduct of this kind of engagement and by pointing out certain constraints in the conduct of such engagements.

The Analytical Approach

The conduct of the evaluation elements of a governmental audit entails an analytical approach and process similar to that used in operational audits and in many management advisory services engagements. Typically, this will involve the following steps:

1. Ascertaining the pertinent facts and circumstances.
2. Seeking and identifying objectives.
3. Defining problem areas or opportunities for improvement.
4. Evaluating and determining possible improvements.
5. Presenting findings and recommendations.

Carrying out these steps calls for appropriate use of procedures generally followed in operational or management audits. Such procedures and activities would often include but not necessarily be limited to the following:

- Interviewing key personnel at all organizational levels, 1
as well as users or "customers" of a program. 2
- Observing, documenting (including flow charting), reviewing 3
and analyzing operations, data collection systems, and the 4
flow of transactions. 5
- Testing transactions and other data. 6
- Reviewing organization charts, policy statements, procedure 7
manuals, performance standards, past performance data, applicable 8
laws, and other pertinent data. 9
- Reviewing and documenting current staffing, equipment, forms, 10
and reports. 11
- Reviewing internal management's reports, internal and indepen- 12
dent audits, other consultants' reports, management letters, 13
etc. 14
- Reviewing budgets, purchases, supply utilization and cash manage- 15
ment. 16
- Analyzing findings to pinpoint problems and weaknesses. 17
- Developing recommendations to solve problems and overcome 18
weaknesses. 19

Evaluation and Measurement Criteria

In its discussion of the expanded audit elements, the AICPA's 21
1973 publication, Auditing Standards Established by the GAO: Their 22
Significance for CPAs, stressed that evaluation and measurement 23
criteria are essential for the conduct of economy, efficiency and 24
effectiveness audits. It stated that the profession should continue 25
to define standards for performing such evaluations. 26

This publication is a step in that direction. It is primarily concerned with the conduct of evaluation engagements. It does not undertake to provide the evaluation and measurement criteria which are essential to the successful performance of such work.

Organizations such as the GAO and The Urban Institute are seeking to develop specific criteria. It appears unlikely that criteria will be documented which can be applied in all situations because of the diversity of governmental operations and program goals. This makes it essential that the practitioner use professional judgment as to the appropriateness of the criteria used in a specific engagement. Sources for such criteria include legislative language, agency standards, policies and procedures, responsible agency management personnel, contractual terms, previous experience with similar activities and authoritative writings on the subject. The use of documentable standards, measures and criteria will give the CPA's report a more authoritative foundation that should aid in its acceptance. Where acceptable criteria cannot be determined and agreed upon, it may be necessary to postpone an evaluation until this key matter is resolved.

The CPA should not place himself in a position where he will unilaterally establish objectives, standards, criteria or measurement methods. However, he may agree to counsel with management in order to develop what is needed. Depending upon the magnitude of the pre-evaluation work, the CPA may choose not to undertake the evaluation engagement at all or to supply such advice prior to the evaluation only after negotiating an extension of the scope of the engagement. He may also propose a separate consulting engagement, aimed specifically at establishing objectives, standards, criteria or measurement methods before

conducting an evaluation. These decisions should be made before
accepting a government contract, as it may prove impossible to make
such changes afterward.

While published material which could help a practitioner to
recognize appropriate evaluation and measurement criteria is limited,
there is some available. The GAO, in conjunction with the Office
of Management and Budget and the Civil Service Commission, has published
the results of a 1973 study aimed at establishing a permanent measure-
ment system for federal entities. It was published in a two volume
report entitled The Permanent Measurement System--Methods, Measures, Re-
sults. Volume I includes descriptions of overall governmental entities.
The report presents a broad gauged system which would have very limited
use in a specific evaluation engagement. However, it does provide useful
background information. Another report of interest is entitled Mea-
suring Effectiveness of Municipal Information Service, by Robert H.
Davis, which appeared in the August 1970 edition of Management Infor-
mation Service, a publication of the Internal City Management Associa-
tion. It includes over three hundred specific measures of efficiency
and effectiveness for municipal functions and also contains material on
how such criteria may be developed. Many of the theoretical measures
cited have been improved in practice since 1970. The article, however,
still provides valuable illustrations in a subject area where little
currently appears in print.

More recently, (February 1974) The Urban Institute and Interna-
tional City Management Association published an initial report on
Measuring the Effectiveness of Basic Municipal Services, which deals
with means for gathering and evaluating effectiveness data on the

municipal level. Suggestions are included for effectiveness measures 1
on solid waste collection and disposal, recreation services, local 2
transportation services, water supply service, wastewater treatment, 3
storm drainage and water quality preservation services, and the handling 4
of citizens' complaints and requests for servicing and information. 5

The Urban Institute and ICMA continue to be in the forefront in 6
developing efficiency and effectiveness measures for such basic ser- 7
vices. Practitioners who perform these evaluations will find their 8
publications to be useful. To illustrate the nature of these criteria, 9
an extensive list of efficiency and effectiveness measures for solid 10
waste collection activities is reproduced in Figure 1 on pages 27, 28, 11
and 29. 12

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Application of Measures
to
Solid Waste Collection Activities
(Urban Institute and ICMA)

Measures	Activities						
	Residential Collections	Commercial Collections	Street Cleaning	Leaf Removal	Brush Removal	Special Collections	Abandoned Auto Removal
A. Efficiency							
1. Tons collected per 1000 dollars or dollars per tons collected (efficiency reciprocal)	X	X	X	X	X	X	
2. Tons collected per man-hour	X	X	X	X	X	X	
3. Households served per 1000 dollars or dollars per household served (efficiency reciprocal)	X				X	X	
4. Households served per man-hour	X				X	X	
5. Commercial establishments served per 1000 dollars or dollars per commercial establishment served		X					
6. Commercial establishments served per man-hour		X					
7. Items removed per 1000 dollars or dollars per item removed						X	X
8. Items removed per man-day						X	X
9. Lane miles cleaned per 1000 dollars or dollars per lane mile cleaned			X	X			
10. Lane miles cleaned per man-day			X	X			
B. Effectiveness							
1. Percentage of residents reporting no spillage	X						
2. Percentage of residents reporting collection noise level acceptable	X				X	X	

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Application of Measures
to
Solid Waste Collection Activities
(Urban Institute and ICMA)

Measures	Activities						
	Residential Collections	Commercial Collections	Street Cleaning	Leaf Removal	Brush Removal	Special Collections	Abandoned Auto Removal
B. Effectiveness (continued)							
3. Percentage of residents reporting no significant damage to private property due to collection activities	X		X	X	X	X	X
4. Percentage of residents reporting no missed collections	X				X	X	
5. Percentage of commercial establishments reporting no spoilage		X					
6. Percentage of commercial establishments reporting no damage to private property due to collection activities		X					
7. Percentage of commercial establishments reporting no missed collections		X					
8. Percentage of cleaned streets with a post cleanliness rating of 1.0			X	X			
9. Percentage of citizens reporting no objectionable street cleaning noise			X	X			
10. Percentage of collection routes completed on schedule	X	X	X	X	X	X	
11. Percentage of calls for special collection pickups responded to within x days or less (for on-demand type services)						X	
12. Percentage of abandoned autos removed within x days or less after receipt of report							X

Application of Measures
to
Solid Waste Collection Activities
(Urban Institute and ICMA)

Measures	Activities							
	Residential Collections	Commercial Collections	Street Cleaning	Leaf Removal	Brush Removal	Special Collections	Abandoned Auto Removal	
B. Effectiveness continued								
13. Percentage of households reporting having seen rats on their block in the past year	X	X	X		X			
14. Number of rodent bites reported per 1000 residents	X	X	X		X			
15. Percentage of blocks with one or more fire hazards	X	X	X	X	X		X	
16. Number of fires involving uncollected solid waste	X	X	X	X	X		X	
17. Percentage of blocks with one or more safety hazards			X			X		
18. Percentage of blocks whose appearance is rated satisfactory (2.0 or better on visual rating scale)	X	X	X	X	X			
19. Average block cleanliness rating	X	X	X	X	X			
20. Percentage of households rating overall neighborhood cleanliness as satisfactory	X	X	X	X	X			
21. Percentage of households not reporting offensive refuse-related odors	X	X	X					
22. Percentage of blocks with abandoned automobiles							X	

Chapter 4

ILLUSTRATIVE APPROACHES TO THE EVALUATION
OF ECONOMY AND EFFICIENCY

The material which follows is intended to provide guidance in the development of work programs and work steps for economy and efficiency evaluations being conducted in accordance with GAO standards. Such guidance, however, must be of a general nature since the GAO standards are general standards and do not attempt to specify the level of detail at which any particular evaluation engagement should be performed. The standards were issued for the benefit of governmental audit agencies as well as public accounting firms. Governmental audit agencies can pursue economy and efficiency in all operations to whatever degree available time and budget will permit. For the CPA, however, an evaluation of economy and efficiency in which the level of detail is not specified might entail a very wide range of fees (a few thousand to several hundred thousand dollars) depending upon the breadth and depth of the study.

Obviously, the requester of the audit and the CPA should agree on both scope and level of detail before the proposal is submitted. The only available guide as to what the GAO might consider an appropriate level of detail is the GAO's Audit Standards Supplement Series No. 6 entitled Air Pollution Control Program, Sassafras County, Maryland. This is an illustrative report on all elements of an expanded audit.

The report indicates that an audit conducted in accordance

with the GAO standards should be responsive to the audit guide 1
issued by the federal agency responsible for the entity's 2
program.¹ While audit guides which include reviews of 3
economy, efficiency and program results will be prepared in 4
increasing numbers, few exist at this time. A simulated 5
audit guide for the Sassafras County study is incorporated 6
as an Appendix to the illustrative report. This example of 7
an expanded audit report, and the audit guide on which it was 8
based, is reproduced in Appendix A of this publication. It is 9
an illustration of what was done - and was acceptable - 10
in one situation. However, some audit requests might demand 11
much more depth than was required in the Sassafras County study. 12

Like the illustrative report, most governmental audits are 13
concerned with a specific unit or a program it is charged 14
with carrying out at the federal, local or grantee level. An 15
engagement will often be structured along organizational lines, 16
involving for example, specific activities within police, fire, 17
public works or recreational departments, or specific programs 18
within such departments. 19

When a study is directed toward a specific organization or 20
program, the practitioner should expect to encounter some services 21
which are performed centrally for several units. Normally, a 22
detailed study of these central services departments would not 23
be undertaken as part of a specific unit's review unless it is 24
incorporated into the contract initially or as an amendment. 25

Illustrations of reviews of unique activities are of limited 26
assistance to practitioners reviewing other kinds of activities. 27

However, many audited entities will have operational aspects 1
which are common to many others, regardless of the activities 2
or goals involved. By choosing two such aspects--data 3
processing and personnel utilization - this publication can 4
illustrate the potential depth of an evaluation of economy and 5
efficiency in areas that practitioners may expect to en- 6
counter in expanded scope audits. The depth of the CPA's 7
review in specific engagements, however, must be a matter of 8
his professional judgment as to what the requester wants 9
and the resultant cost/benefit considerations. 10

The following two illustrations, which are not intended to 11
be used as evaluation checklists, illustrate the depth to which 12
practitioners might investigate certain areas, if required. In 13
the long run they may also encourage greater consistency of 14
approach (not depth) in conducting evaluations of data process- 15
ing and personnel utilization. 16

In some situations, a CPA may be asked to review a 17
limited area, e.g., the data processing installation in a 18
city's public safety department. His report must emphasize 19
the limited scope of his study to avoid having his findings 20
interpreted as covering a broader area. Even so, the prac- 21
titioner should consider how the limited area relates to 22
the overall activity of which it is a part, in order to 23
place his findings in a proper frame of reference. 24

Illustrative Approach for Evaluation of Data Processing

Computer installations have differing objectives and operating requirements, and not all installations will have the same problems. The purpose of the following illustration is to provide general guidance to the practitioner in developing a work program. The scope and depth of review required for any particular engagement must be determined on the basis of the applicable audit guide (if any) and the understandings documented in the engagement agreement.

In the initial planning for the evaluation of any data processing activity's operational economy and efficiency, four major areas of inquiry should be considered:

- Computer outputs.
- Organizational alignment and managerial functions.
- Information systems.
- Technical competence.

Each of these potential review areas is discussed below.

A. Making Sure Computer Outputs are Needed

A computer may sometimes be used to perform unnecessary work or work which should be done some other way. The practitioner should first discern if the entity is following formalized procedures for reviewing existing outputs. The review procedure for each output should determine the following:

- How is the report or other output used? 1
- Should it be eliminated? 2
- Should the computer be used to prepare it? 3
- Should it be replaced by some other existing
report? 4
- Should it be replaced by combining it with
another report or modifying another report? 6
- Should the information content be changed? 8
- Should the preparation frequency be changed? 9
- Should the number of copies be changed? 10

If the entity is not reviewing the need for its computer
outputs, the practitioner should consider (a) recommending
institution of such procedures, and (b) conducting suitable
inquiries on a sample basis. Ascertaining whether users have
been trained in the capabilities of the reporting system is a
related aspect of evaluating the efficient use of computer out-
puts. 17

B. Determining the Efficiency of Organizational
Alignment and Managerial Functions 18

Efficient data processing operations cannot be separated
from effective management of the computer center. The prac-
titioner should, therefore, consider including a review of
the following in his work plan. 23

1. Is the data processing function properly placed
organizationally to provide effective service to
the entire organization, and is it permitted to
serve the entire organization? 27

2. Are there adequate descriptions of the duties and responsibilities of the key members of the data processing organization?
 - 1
 - 2
 - 3
3. Are appropriate information, techniques and processes being used to manage and control the data processing operations?
 - 4
 - 5
 - 6
 - Are there stated goals and objectives?
 - 7
 - Is there a long range plan?
 - 8
 - Are there adequate project controls and check points?
 - 9
 - 10
 - Does the installation have a formal reporting system which identifies work accomplished compared to work planned, problem areas, re-runs, machine utilization and downtime, set-up time, idle time, timeliness of providing products to users and actual costs compared to plan?
 - 11
 - 12
 - 13
 - 14
 - 15
 - 16
 - 17
 - Does the installation have and use written operating instructions covering physical security of data files and access to data, contingency procedures in the event of equipment failure and major disaster, operations manuals or run books, and other computer room procedures?
 - 18
 - 19
 - 20
 - 21
 - 22
 - 23
 - 24

C. Determining the Efficiency of Information Systems
Operations

1
2

Many outputs from early computers were prepared by simply
converting punch card systems to function on faster computer
equipment. In many instances little was done to redesign
existing systems to take advantage of advanced features of
the computers subsequently installed. In such instances,
productivity may be low and operating costs higher than
necessary, and service to users may be less than optimum.
At the other extreme, systems sometimes have been designed
to take advantage of the capabilities of high level computer
and communication technology and may be far more sophisticated
and costly than needed to meet information requirements. In
other cases, existing systems do not include adequate controls
over data entry, processing and reporting operations, re-
sulting in the production of erroneous information and ex-
cessive computer reruns.

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To respond to the above considerations, the practitioner
should consider reviewing the extent to which the entity's
information systems are designed for efficient operations by
examining systems documentation and interviewing data process-
ing personnel and users. Such a review would seek to deter-
mine whether systems:

18
19
20
21
22
23

- Are designed to exploit fully the capability
of the computers installed.

24
25

-- Are designed to satisfy actual requirements 1
of the user, or designed primarily to justify 2
acquiring more sophisticated computer and com- 3
munications equipment. 4

-- Include data and program controls to assure 5
accurate input and processing of data and 6
reporting of information. 7

He should question whether the entity's approach to design- 8
ing and installing information systems is sound and efficient. 9
He should also determine whether the data processing installa- 10
tion has adopted design and programming standards. Some examples 11
of what might be included in such standards are statements con- 12
cerning: 13

-- Separation of the systems development ef- 14
fort into logical segments such as feasibility 15
study, preliminary systems design, detailed 16
design, programming, conversion preparation, 17
systems testing and conversion. 18

-- Documentation of information requirements, 19
program specifications, programs, manual pro- 20
cedures. etc. 21

If a review of this aspect of a data processing operation 22
is conducted, identification of system or application programs 23
with performance problems should be included in the practitioner's 24
report. Some specific means the practitioner could use to deter- 25
mine this are as follows:

- The portion of the computer's operating system which records the resources used in processing application programs will show the amount of storage, CPU time, and input/output resources each program uses. Comparison of these records with the estimates made for the programs prior to installation will often pinpoint problem programs.
- Computer operators are frequently able to provide insight into opportunities for improving application programs. For example, excessive reruns for a given application may be attributable to the absence of a restart capability in the program.
- Software and hardware monitors can be useful in spotting inefficiencies in specific application programs, and also in computer equipment configurations.

D. Determining Whether Technical Competence is Adequate

Efficiency in system development and operations and responsiveness to user requirements are dependent upon the technical and managerial competence of data processing personnel. Therefore, in the performance of his evaluation of any data processing operation, the practitioner should consider the competence of data processing personnel. In addition, he should determine whether continuing education and training programs are available to data processing personnel

so that they can maintain or improve their skills. 1

Illustrative Approach to the Evaluation of 2
Personnel Utilization 3

People are the universal resource that organizations must 4
manage. The quantity and quality of personnel and the way 5
in which they are managed will have a tremendous impact both 6
on economy of operation (cost) and efficiency of operation 7
(level of service). 8

The diversity of governmental operations is extremely 9
broad and inclusive. The purpose of the following illustration 10
is to alert the practitioner to the many facets of personnel 11
utilization that could be reviewed in an engagement to evaluate 12
economy and efficiency. The scope and depth of review required 13
for each engagement must be determined on the basis of the 14
applicable audit guide (if any) and the understandings docu- 15
mented in the engagement agreement. 16

In developing a work program for an evaluation of the 17
economy and efficiency of the use of personnel, four potential 18
areas of inquiry should be considered: 19

- The goals and objectives toward which the 20
personnel are working and their understand- 21
ing of them. 22
- The organizational structure within which 23
the personnel function and the interrela- 24
tionships with other units, entities, func- 25
tions and programs. 26
- The nature of the work being performed by 27

the personnel, the systems and procedures 1
in use, the equipment involved and the 2
capabilities of individuals to perform 3
satisfactorily in their assigned duties. 4

- The managerial controls being exercised 5
over the personnel. 6

The following discussion of these aspects should facilitate 7
the practitioner's decision as to whether and how deeply he 8
should review each of them. 9

A. Goals and Objectives 10

Goals and objectives may be defined by legislative enact- 11
ment, departmental criteria or other recognized authorities. 12
They provide formal statements of broad intent as well as 13
establishing the desired or expected accomplishments. They 14
provide a means for measuring the degree of progress. 15

In order to set a firm foundation for an evaluation of 16
personnel utilization, the practitioner would review and 17
document the following: 18

- What is the nature of the entity, unit, 19
function or program concerned? 20
- Does it have documented or readily definable 21
objectives? 22
- Are the goals and objectives understood by 23
the personnel involved? 24
- What assignments and standards have been set 25
for the personnel involved? 26

B. Organization Structure

Organization can be defined as a long term association created and maintained to attain certain objectives and to perform a particular mission. The structure of an organization is a formal expression of that systematic arrangement. It describes relationships among the parts of the organization and among the people who are members.

All organizations should begin with goals and objectives that are recognized and expressed; personnel assignments should contribute to the achievement of those goals and objectives.

The organization structure and its relationship to goals, objectives and activities could be reviewed as follows:

- Are lines of authority and responsibility clearly delineated to assure the proper flow from supervisory authorities to subordinates?
- Are personnel positions properly designed, documented and compensated?
- Are personnel policies and practices documented and followed?
- Are supervisory assignments appropriate for the nature and structure of the work performed?
- Are there laws or regulations or union contracts which affect the utilization of personnel?

C. Nature of the Work

A key to evaluating the effective utilization of personnel lies in the nature of the work the personnel are required to do and how they are going about it. To facilitate the practitioner's decision as to the depth of review required, the "walk-through" (physical observation) is a useful initial method of observing productivity, general working conditions, housekeeping, storage, security and other pertinent matters.

The practitioner, in order to understand problems relating to the work done by the personnel, could then review the following:

- Is the work being done necessary or have "make-work" practices and other non-essential work operations become part of the activities?
- Is the work duplicated elsewhere, or can it be combined with related activities for greater efficiency?
- Are all current positions necessary to do the work performed or should they be realigned or regrouped for more efficient operations?
- Are the systems and procedures being followed producing adequate results and are they documented to facilitate training?
- Are the personnel properly trained and instructed in their tasks?
- Do the personnel assigned to specific tasks have the appropriate level of skill?

-- Do the line managers retain responsibility for use 1
of effective methods and procedures or do they believe 2
staff is responsible for this? 3

D. Managerial Control 4

Management of personnel includes recruiting, employing 5
and retaining essential manpower as well as achieving opera- 6
tional economy and efficiency. Leadership and guidance is 7
necessary, with a clear assignment of responsibilities. The 8
management team must monitor work performance to achieve 9
the best results. In achieving economic and efficient 10
utilization of personnel, managers have five principal 11
responsibilities: planning, organizing, directing, coor- 12
dinating and controlling. The practitioner could include 13
the following in his review of this aspect of personnel 14
utilization: 15

-- Is management reviewing the performance 16
information necessary to exercise proper 17
control, such as: 18

- overall work counts 19
- individual or unit productivity data 20
- machine downtime data 21
- processing time data 22
- premium time records 23
- data on absences and vacancies 24

- Have performance standards been established 1
and are they being adhered to? Is the work 2
suitable for work measurement or similar 3
techniques? 4
- Are error ratios higher than acceptable for 5
economic and efficient performance? Is the 6
work suitable for quality control techniques? 7
- Are work outputs produced in a timely 8
manner? Is the work suitable for sched- 9
uling techniques? 10
- Are personnel costs in excess of the authorized 11
or budgeted amounts? Is the situation suitable 12
for budgetary or cost control techniques? 13

* * * * *

The Illustrative Report (Appendix A) is an example of a 14
report on a full scope audit under GAO standards. However, since 15
it was prepared for governmental audit agencies as well as CPAs, it 16
may not comply in all respects to the standards under which 17
a CPA would report. While it includes a report of the work 18
done in response to the economy and efficiency evaluation 19
section of a simulated audit guide, the illustrative approaches 20
in this chapter, for evaluations of economy and efficiency in 21
data processing and personnel utilization, are perhaps more 22
suggestive of the depth to which such studies might be carried 23
if so indicated in an RFP or audit guide. 24

The CPA should obtain any applicable audit guide before 1
preparing a work program. When working at a state or local 2
level, he should follow the funding flow to the source to deter- 3
mine whether there is an applicable audit guide. (Assistance 4
in this is sometimes available through the AICPA's Washington, 5
D.C. office.) When an audit guide does not exist, or does not 6
cover all aspects of an expanded scope audit, the CPA should 7
document the planned scope and level of detail for the engagement 8
and have all parties concur before beginning work. 9

Chapter 5

PROGRAM RESULTS EVALUATION

Governmental programs are activities or groups of activities 1
undertaken by an entity or agency to provide a service to the 2
public. Program results evaluation engagements will frequently 3
concern specific activities related to: 4

- Health and Safety 5
- Education 6
- Transportation 7
- Public Safety (Police and Fire Services) 8
- Sanitation 9
- Housing 10
- Utilities 11
- Environment 12
- Agriculture 13
- Economic Opportunity and Employment 14
- Recreation 15
- Culture (Library, Museum) 16

Local funding for these activities often includes federal or 17
state funds, and evaluations of program results may increasingly 18
be required. 19

In evaluating governmental program results, the practitioner 20
must be guided by the legislative intent. The practitioner should 21
assure himself that the conduct of the program does not overlook 22
or conflict with the legislative language. Legal assistance can 23
be helpful. 24

Purpose of Program Results Evaluation

Governmental program planners and policy makers must continually make judgments about the value of on-going programs in order to allocate resources effectively. When a CPA is engaged to evaluate program results, however, it is not intended that it include an evaluation of the worth of the program or the advisability of its continuation. The practitioner's purpose in reviewing the program is to determine the following:

Objectives

- Are the program's objectives (as established by the legislature or other authorizing body) being accomplished in terms of measurable results?

Assessment

- Is the current assessment of achievement, as reported by program management, valid?
 - Are the evaluation criteria meaningful?
 - Are the measurement methods appropriate?
 - Are the data accurate?

Alternatives

- Have alternatives been considered by the entity which might produce the desired results at a lower cost?

These three major points of program results evaluation are discussed below.

A. Objectives

The Urban Institute in Washington, D. C. has done considerable

research on the evolving nature of program results evaluation and
has published a number of valuable books. In Federal Evaluation
Policy by Joseph S. Wholey et al. (1973), evaluation is described
as an activity designed to:

- Assess the effectiveness of an ongoing program
in achieving its objectives.
- Distinguish between a programs effects and
other causal factors.
- Improve results through modification of current
operations.²

The primary focus in this element of the audit is clearly to
evaluate the program's success in achieving results. The output
of a program is the necessary object of scrutiny; economy and
efficiency considerations in administering the program are secon-
dary except as they relate to the quantity or quality of the out-
put. Economy could be a negative factor if it results in an in-
ability of the program to achieve its objectives or dilutes poten-
tial benefits by preventing full and effective use of the funds
authorized for the program.

B. Assessment

In order to determine whether program objectives are being
achieved, the practitioner must be satisfied that the criteria used
are valid and do, in fact, reflect accomplishment of the objectives.
There is often tendency on the part of program managers to measure
results in terms of program activities; that is, the efforts ex-
pended in pursuit of objectives. While this may be valuable for
supervisory purposes, and for the determination of economy and

efficiency, it is not, in most instances, useful for assessing
program results. Measures of overall program effectiveness must
concentrate on accomplishments, not on activities. In evaluating
a water quality program, for example, the improvement in water
quality is what should be measured. Dollars spent, chemicals
consumed, or strategies in force are important, but they are not
pertinent to the measurement of program success. When success
is not easily quantifiable, as is frequently the case in social
programs, the task can be difficult or even impossible at the time
of the engagement. This does not justify equating program acti-
vities with program success in the CPA's report.

Evaluating the validity of management's assessment of program
results will require the practitioner to be satisfied with the
system or analytical process used by management as well as with
the reliability of the actual data which have been used as a basis
for the assessment. CPAs have long worked with the concepts of
objectivity, evidential soundness and systems evaluation and are
therefore familiar with what is required in such reviews. However,
difficulties may be encountered in the process of evaluating
empirical studies. Research specialists with extensive knowledge
relating to the activity (program) being reviewed may have to be
consulted in some instances. (In the private sector, this would
be similar to using an industry specialist rather than a technical
specialist.)

C. Alternatives

In regard to whether alternatives exist which can achieve the
desired program results more effectively or at a lower cost, the

practitioner will report on the specific areas in which he can
make constructive recommendations. If the program is to be
evaluated for economy and efficiency as well as program results,
an in-depth study such as that described in the previous chapter
is required. If the engagement calls only for a program results
evaluation, any economy or efficiency recommendations not impact-
ing the program results would be purely a by-product of the work
entailed in the evaluation of program results. In either case,
however, the practitioner should be alert to desirable alternatives.
Entity management may have considered the alternatives, but if they
did not, the practitioner may suggest further study. A recent GAO
document³ suggests that a consideration of alternatives might include
the following:

- Developing a range of alternatives
- Screening the preliminary alternatives
- Estimating the measurable consequences
- Assessing provisional orderings
- Determining the impact of constraints
- Reassessing the orderings of the alternatives
- Checking the completeness of the assessment"

Defining the Scope of a Program Results Evaluation Engagement

Defining the scope of a program results evaluation is very
much analogous to the same process in a management advisory
services engagement. The CPA must, by means of a survey, deter-
mine the depth of review required to develop findings and to
make appropriate recommendations. He may also have to make judg-
ments on whether participation of other experts will be required.
Five major areas should be surveyed:

- Nature of the program: goals and objectives 1
- Nature of the organization 2
- Policies and procedures for carrying out 3
the program 4
- Financial data 5
- Measurement system 6

A. Nature of the Program: Goals and Objectives 7

A key determinant of the scope of a program results evaluation 8
is the nature of the program itself. It is fundamental that the 9
program being reviewed be understood by the practitioner. In the 10
case of grants, the practitioner will have to review the grant 11
request and grant agreement to determine objectives and conditions. 12
In the case of organizations or programs, considerable research 13
may be necessary, including Federal law, legislative history, and 14
Federal regulations. The assistance of qualified counsel may be 15
necessary. 16

The program goals and objectives define the standards against 17
which measurements should be based. They also provide valuable 18
insight into the specific nature of the program and the specific 19
technical skills which may be required. 20

If a pre-contract survey reveals the absence of defined 21
goals and objectives, the CPA may decide to counsel with management 22
to identify them as a part of the engagement. Alternatively, he 23
may conclude that a more extensive effort is necessary, requiring 24
further work on the part of management, either alone, or through 25
a separate consulting engagement. 26

B. Nature of the Organization 27

The nature of the organization carrying out the program is 28

essential background information. Of special interest are:

- Entity status (public or private).
- Mission (single or multi-purpose).
- Tenure (temporary or permanent).
- Organization structure, (responsibilities, functions, and reporting relationships).
- Relationships of the program to other programs within the organizational structure.

C. Policies and Procedures for Carrying Out the Program

The practitioner should survey the entity's current management processes, including planning, policies, procedures, performance measurements and controls, and the process by which management seeks continually to improve the program's productivity.

D. Financial Data

A program results evaluation includes cost considerations. The availability of budgetary and detailed expenditure data will be important to work program determination. If a financial audit is not part of the engagement scope, the pertinent financial data will have to be accumulated separately and identified as unaudited.

E. Measurement System

Perhaps the most important determinant of evaluation scope is the degree to which reliance can be placed on the program results measurement system or process, in the same way that the review of internal control and accounting procedures determines traditional audit scope. Obviously, little credence can be attached to program results data produced by a basically unreliable system or evaluation process. All important aspects of program evaluation systems

must be documented and tested. The scope of this testing will depend upon the amount of reliance which can be placed upon the controls built into the system. In the case of empirical results studies, the plan of study and study design will be important aspects in the practitioner's determination of measurement validity.

A critical aspect of a program results measurement system is the suitability of the measures themselves. There will almost never be one net result, like profit. Often, a direct measure of program results will not be available. Even if there are measures in use, the practitioner must still decide if they correctly define effectiveness and must determine the correlation between the measurements made and actual program results. This may require the use of specialized program consultants.

Conduct of a Program Results Evaluation

In evaluating program results as reflected in a program's records and reports, the practitioner must consider the following:

1. Are the evaluation criteria meaningful?
2. Is the method for measuring program results appropriate?
3. Are the program data accurate?
4. Is management's assessment of the achievement of program goals and objectives reasonable?

Once the data collection and analysis system itself has been documented and tested, major emphasis is placed on the detailed examination of the results measurements, in accordance with the agreed scope. The professional role of the practitioner is to make a judgment, based on his examination of the quantitative and

qualitative measurements produced by the system or analytical
process.

The quantitative judgments include:

- Correlation with objectives
- Statistical validity
- Consistency
- Comparability
- Arithmetic accuracy

While this process of quantitative evaluation will not be
new to a practitioner, the measures themselves may be unfamiliar.
Qualitative judgments, by their nature, are not as precise as
quantitative judgments. Nevertheless, qualitative judgments will
often be required, and the practitioner should be prepared to de-
fend them.

In judging the validity of the methods used to measure program
results, the practitioner should be aware that a number of methods
for measuring program results can be utilized by management.
These include:

1. Comparing data accumulated prior to program
inception to data accumulated later.
2. Comparing post-implementation data with
equivalent data gathered in areas where the
program is not in effect but conditions are
otherwise similar.
3. Establishing control groups which are not
affected by the program, so that comparisons
can be made regularly between affected and
unaffected groups.

4. Comparing estimated data for pre-program periods to actual post-implementation data. 1 2
5. Establishing quantitative and qualitative program results targets when a program is first implemented, and measuring program results on the basis of advancement toward the targets. 3 4 5 6 7

Measurement methods should be capable, wherever possible, of differentiating changes attributable to the program from other changes. Unfortunately, this cannot always be done. An example would be the attempts to evaluate the "Head Start" program, which would have required separating the many influences on ghetto youngsters from prenatal days onward. The credibility of the measurements, however, depends heavily on the existence of a demonstrable causal relationship between program activities and the accumulated results data. Any other factors which could have caused the observed changes should be carefully considered. This is particularly important when comparisons are made with data gathered in areas where the program is not in effect (number 2 on preceeding page). 8 9 10 11 12 13 14 15 16 17 18 19

In some cases, management will not have made an assessment due to the absence of accumulated data or measurement criteria, or for other reasons. The CPA may be asked to participate in a program results evaluation effort himself by establishing criteria, accumulating data and then assessing the program results. In such instances, the nature of the work required and the practitioner's responsibility will differ substantially from an evaluation of management's assessment of program results. Since this may not be known in advance, the CPA should arrange contractual 20 21 22 23 24 25 26 27 28

options to cover such situations so that he will not be limited in the
exercise of his professional judgment as to whether and under what
conditions he will undertake such work.

Illustrative Approach to a Program Results Evaluation

Unlike evaluations of economy and efficiency, which have
long been conducted in government and industry under other names,
program results evaluations, in which the results are not described
in terms of productivity increases or dollars and cents, do not
yet have an extensive body of literature which includes guidelines
and case histories.

Appendix A of this document reproduces GAO Audit Standards
Supplement Series No. 6, the Illustrative Report, Air Pollution
Control Program, Sassafras County, Maryland. It includes a sample
audit guide for a program results audit for an air pollution con-
trol program. A practitioner should obtain any applicable audit
guide for the program he will be evaluating before developing a
work program. Such guides may eventually include material on the
evaluation elements of expanded scope audits.

The practitioner who undertakes a program results evaluation
engagement where management has made an assessment of program
results should consider the following possible pattern of steps
when developing his work program:

1. Review the goals of the program with manage-
ment, and confirm the continued applicability
of the goals identified during the survey.
2. Review the evaluative criteria and recommend
any necessary changes.

3. Confirm the program objectives for each of the evaluative criteria. 1 2
4. Conduct appropriate tests to determine whether the entity is complying with any applicable non-financial laws and regulations affecting program activities (e.g. environmental, equal opportunity, etc.) 3 4 5 6 7
5. Review and substantiate data and reports determining performance for each of the evaluative criteria. 8 9 10
6. Conduct a general review to determine whether program results are in keeping with management's assessments, vary from reports or reflect inaccuracies in measurement or analysis. 11 12 13 14
7. Develop and document conclusions and recommendations. 15 16

Program Results Evaluation Pilot Projects

In 1973, the General Accounting Office and the International City Management Association established pilot program results evaluation studies in ten cities, two counties and one council of governments. (Four of the pilots utilized independent public accounting firms, while the remainder involved internal staff auditors, management consultants and personnel from other government agencies.) Reports of all studies, now completed, indicate varying degrees of success.⁴

While the engagement circumstances surrounding these pilot projects differed considerably from what a CPA might encounter

in an actual engagement, there is something to be learned from
what the involved city management personnel identified as the
benefits and problems, as seen from their own perspective.

Reported benefits include the following:

- Increased concern about and a better
understanding of program results, lead-
ing to greater concentration on results
rather than processes.
- An opportunity for employees to make sug-
gestions and participate in the improve-
ment of program operations.
- An insight into the potential benefits
of program results audits and a stimulus
to the conduct of additional audits.
- Direct savings resulting from implementa-
tion of recommendations.
- Development of a greater sense of accounta-
bility on the part of the line managers.
- Improvements in community services.
- A first step towards formalizing a public
feedback process.

Problem areas revealed a need for:

- Better briefing of entity personnel to
reduce increasing anxieties.
- Increased availability of information
required by the evaluation team.
- Clearer understanding of the political
and economic constraints of the entity

- on the part of the evaluation team. 1
- Less concentration on financial aspects 2
and more on program operations and results. 3
 - Better communication of weaknesses and 4
findings to top level management during 5
the course of the engagement. 6
 - More program orientation and technical 7
proficiency on the part of evaluation 8
team members. 9
 - More emphasis on reviewing measurement 10
systems as opposed to current data. 11
 - Greater caution in placing dollar values 12
on recommendations unless they are adequately 13
supported. 14

Program Results Engagement Caveats 15

The art of evaluating program results is still in a very early 16
stage of evolution. If called upon to conduct direct evalua- 17
tions rather than evaluations of management's assessment of 18
results, the practitioner must realize the experimental nature 19
of what he is undertaking. There are no AICPA standards such as 20
those for financial audits, or even guidelines such as those 21
which can be found for evaluations of economy and efficiency in 22
certain operations. Frequently, adequate criteria, meaningful 23
measures, or accurate data will be lacking, making an evaluation 24
impossible without extensive preliminary work. In many cases, 25
governmental programs do not generate short-term results, making 26
meaningful results measurement efforts a matter for the future. 27

When making an evaluation of management's assessment of results,
care must be exercised for the same reasons. Management's as-
sessment is often "experimental" and the CPA is being asked to
validate the experiment.

In addition to difficulties that may affect the conduct of
the engagement, the potential effect of such engagements on
the political environment in which the program exists must be
appreciated by the CPA. All in all, there is much to be learned
before program results evaluation engagements become routine.

Chapter 6

REPORTING EVALUATION ENGAGEMENT FINDINGS

Professional standards for reports on financial audits are 1
extensively documented and readily available. In contrast, 2
appropriate guidelines do not exist for reports on evalua- 3
tions of economy, efficiency or program results. The prac- 4
titioner should, therefore, refer to such guidance as is 5
available in the GAO standards document and the audit stand- 6
ards supplement series, particularly No. 6, the Illustrative 7
Report, Air Pollution Control Program, Sassafras County, 8
Maryland. Other actual GAO reports are available and lists 9
of such reports are published monthly.¹ 10

Some valuable (though unofficial) material on reporting the 11
results of operational audits, which are somewhat similar to 12
evaluation engagements, appears in an AICPA Continuing Profes- 13
sional Education course entitled, Operational Auditing - Basic. 14
The balance of this chapter presents an edited and augmented 15
version of that material.² 16

An evaluation engagement report will differ from a financial 17
audit report, particularly with regard to the following: 18

1. Expression of an Opinion - A financial 19
audit report normally contains the CPA's 20

opinion unless it specifically states
that no opinion is expressed. The evalua-
tion engagement report contains no similar
expression of opinion. The omission of an
overall opinion should be stated in the original
engagement letter and in the report.

2. Subject Matter - The difficulties encountered
in writing an evaluation engagement report
stem from the infinite variety of subject
matter. Also, for each activity there
are readers with differing backgrounds
and needs--from high level officials on
down. The practitioner must be able to
reach all levels and act as an expert
"translator," rendering technical language
and complex concepts into plain English.
He must write for the reader and avoid
technical jargon.

To invite reading by high level individuals,
many CPAs condense all major findings and
recommendations into a short summary report.
Detailed reports should also be available
if any such individuals indicate interest

in a specific area. Reducing a voluminous report to a short summary demands that priorities be assigned to each finding and that only those of greatest significance be mentioned.

The assignment of an importance rating to findings and recommendations and reporting them in order of decreasing importance is another aid to the time-conscious reader.

3. Report Acceptance - In financial and accounting areas, a CPA is usually accepted as an expert. In these areas his opinion is therefore seldom questioned, and the basis for a recommendation or opinion may be stated in general terms and still be entirely acceptable. The same does not necessarily apply to reports on operational activities.

The practitioner can help overcome possible reluctance to accept the report by:

- a. Delineating clearly the scope of his study and communicating frequently with operating personnel during the study.
- b. Explaining the standards or criteria used in measuring performance.

- c. Setting forth explicitly the evidence 1
supporting his findings, including any 2
developed by experts outside his firm. 3
- d. Discussing report drafts with the 4
supervisors and managers of the entity 5
and, if appropriate, including their 6
views in the report. 7

These matters are discussed more fully in the following para- 8
graphs. 9

- a. Scope - In an evaluation engagement report, 10
the statement of scope requires careful 11
drafting to tell the reader what the prac- 12
titioner did and what he did not do. Here 13
the practitioner can set forth the limita- 14
tions of his study when he wishes to disclaim 15
responsibility for technical areas beyond 16
his competence. For example, in a review 17
of controls over engineering drawings, the 18
practitioner may state his findings on the 19
controls devised by management to ensure 20
the accuracy of drawings, but he may wish 21
to point out specifically that he did not 22
examine the quality of the drawings them- 23
selves. If the engagement does require 24
a review of the quality of the drawings, 25

he should secure adequate counsel from
outside experts. Unless precautions are
taken, the CPA could be held responsi-
ble for the quality of the drawings and
all subsequent activities that depend
upon that quality.

- b. Standards - When reporting on a technical
area, the practitioner gains better ac-
ceptance if he sets forth the standards or
criteria used in measuring the function or
activity he has reviewed. He may determine
these from statements of policies and pro-
cedures, from discussions with responsible
management personnel, from contractual terms,
or from authoritative writings on the subject.
Again using the previous example concerning
a review of engineering drawing controls, the
practitioner might establish the following
standards-related documents as the basis for
his findings: (1) an engineering standards
manual, available to all draftsmen, setting
forth the company's drafting requirements; (2)
reports of drawings reviewed by independent
drawing reviewers to ascertain whether the com-
pany's drafting instructions have been followed
and that the work is accurate; (3) management
reports on the number of drawing corrections
required to correct drawing defects.

The use of documented standards as yardsticks to
measure performance will form the basis for
an evaluation that should gain acceptance.
Where standards have not been established
by management, the need for them should be
reported.

- c. Evidence - Expressions on operational ac-
tivities, particularly adverse conclusions,
must be clearly supported by adequate
evidence based on analyses and tests,
if they are to be accepted. Still using the
engineering drawings as an example, the report
could set forth the following reviews made:
(1) the number of draftsmen interviewed to
determine whether they had handbooks readily
available to them, and the number of hand-
books in use that had been compared with a
master volume to make sure that they were
up-to-date; (2) the number of drawings
examined for evidence of engineering check
and compliance with corrections made as re-
quested by the checkers; (3) the substantiation
of the statistical data given to management
on the number of drawing corrections required
by production departments.

In his report the CPA should specify where
he has relied on outside experts and clearly
state when he is not accepting responsibility
for the work of those outside experts. (Note:
When reporting on an audit of financial state-
ments, the auditor is not permitted to make
reference to reliance on outside experts
(SAS #11). However, in evaluation engage-
ments, reference to outside experts is per-
missible and often necessary.)

- d. Discussion of Draft Report - Discussion of the
evaluation results with operating personnel
is of special importance. It is essential that
the practitioner state and interpret his facts
correctly. Also, he must be certain to consider
all the factors that touch upon a particular
operation. Finally, the practitioner must be
sure to translate the technical jargon accurately;
operating management may attach meanings to
certain words which the practitioner has
perhaps not clearly comprehended. For this
reason it is recommended that the practitioner
review his findings and conclusions with a
knowledgeable member of line management prior
to his formal report to management. This "dry
run" will help determine whether the initial
conclusions are reasonable.

Positive Reporting

Since one of the main purposes of evaluation engagements is to assist management in improving operations, the practitioner should strive to emphasize the positive in reporting to them. Therefore, criticism of operations should be constructive. Experience has shown that operating management is more cooperative if you express comments in a positive way, using such words as strengthening, improving, increasing, enhancing, etc. Proper use of this technique will not conceal negative findings but will present them in a way less likely to cause a defensive reaction which could destroy the report's value.

When activities are found to be efficiently and effectively operated or when it is known that earlier recommendations have been implemented, the report should include comments on these actions. Too often the omission of favorable comments completely distorts the perspective of the reader. From a report containing solely critical comments, he may conclude all-around poor performance; whereas, the substandard performance may be in only a small fraction of the total operation. Positive-type reporting can significantly benefit client relations even though it may require some extra effort by the practitioner.

Reporting of a Finding

Well developed evaluation findings have certain distinct but common attributes which provide a basis for the report: (1) Condition, (2) Criteria, (3) Effect, (4) Cause, and (5) Recommendation.

1. Condition - For each finding there should be 1
a statement of condition describing the situa- 2
tion. This statement should specifically identify 3
the problem, that is, what needs strengthening, 4
what needs improving, what should be corrected 5
and why, etc. The statement should also provide 6
perspective, indicating whether it is an isolated 7
or a wide-spread condition. Information making 8
up the statement of condition must be accurate, 9
well-supported and worded as clearly and precisely 10
as possible. 11
2. Criteria - Criteria used for the statement of 12
condition section should be clearly identified, 13
using such sources as laws and regulations, con- 14
tractual terms, accepted specifications, criteria 15
established by management, etc. Often the 16
practitioner may have to rely upon his pro- 17
fessional knowledge, experience, background, 18
and personal skills. In these situations, 19
he assumes the burden and obligation to con- 20
vince the report reader of the validity and 21
wisdom of the criteria. Of course, the further 22
away the practitioner goes from relying on some 23
outside authoritative source, the more contro- 24
versial his finding is likely to be. Conversely, 25

there are often situations where the condition virtually speaks for itself.

3. Effect - Whereas the legitimacy of a finding depends on criteria, the attention given the finding depends largely on its materiality, which is judged by effect.

Efficiency, economy, and effectiveness are useful measures of effect and are frequently stated in quantitative terms such as dollars, time, units of production, number of procedures and processes, or transactions. Where past effects cannot be ascertained, potential future ones may be presented. Sometimes, effects are intangible but of major significance. In any event, the effect of the condition should be presented as clearly as possible.

4. Cause - Before the practitioner can make constructive recommendations, he needs to determine the cause(s) for the condition or problem. When it is known why something has happened, recommendations can be made to prevent it from recurring. Where the cause is physical, pictures included in the report will often convey the idea more effectively than words.

5. Recommendation - Possible lines of corrective or preventive action are needed as a basis for constructive recommendations.

When it is not practicable to be specific, a general recommendation is appropriate. For example, the practitioner might suggest additional study in areas where he cannot make specific recommendations. In all cases, however, the relationship between the cause and the recommendation should be clear and logical so that both are presented in a harmonious manner.

In making recommendations, the practitioner should see them as management might see them, weighing increased benefits against their costs.

Suggestions advanced by the practitioner for corrective action should be able to withstand certain tests.

- a. Are the corrections economical? Would they cost more than a continuation of the deficiencies?
- b. Are there other much simpler, if slightly less perfect methods available to correct the deficiency?

- c. Does the corrective action go to the heart of the deficiency or just correct symptomatic matters? 1 2 3
- d. Does the corrective action take into account why the deficiency occurred and who was responsible for it? 4 5 6

Recommendations for corrective action are, from entity management's point of view, an important aspect of the practitioner's report. In pointing out problem areas, the report may only be reinforcing management's knowledge of a situation which it has been unable to correct. In suggesting a corrective action, the practitioner is providing management with an approach which management may accept, reject or modify, but which will more likely result in some management action. Since this is the intent of such recommendations, the report should specify where the responsibility for taking action lies within the entity being reviewed. 7 8 9 10 11 12 13 14 15 16 17

Chapter 7

RELATIONSHIP OF EXISTING PROFESSIONAL STANDARDS TO
EXPANDED GOVERNMENT AUDITS: INTERPRETIVE COMMENTS

In conducting audits for any client, CPAs are guided by 1
basic professional standards which have long been accepted. Just 2
as there can be pitfalls in responding to an RFP for a govern- 3
mental audit without considering the potential effects of the 4
expanded audit elements on engagement planning, there can also 5
be problems if the practitioner applies only the generally accep-6
ted auditing standards to engagements involving evaluations of 7
economy, efficiency and program results. The purpose of this 8
Chapter is to alert the practitioner to the need to adapt the 9
existing standards to what may be a very different kind of audit.10

Engagements to evaluate efficiency and economy or program 11
results are referred to as audits by the GAO. It is apparent, 12
however, that these expanded scope audit elements draw heavily 13
not only on auditing and accounting skills but upon the tech- 14
niques and expertise more typically associated with the conduct 15
of operational and systems reviews as well. The AICPA's gen- 16
erally accepted auditing standards are designed to be applicable 17
when a CPA is associated with financial statements. There are 18
also MAS practice standards, which are applicable in carrying 19
out a management advisory services engagement. In many situa- 20
tions, the AICPA's generally accepted auditing standards and 21
the MAS practice standards, either separately or collectively, 22
may not be adequate for these expanded scope audits as defined 23
by the GAO. Therefore, presented on the following pages are 24
interpretive comments on certain existing standards of the CPA 25

profession which are relevant for the evaluation elements 1
of an expanded scope audit. Practitioners should continue 2
to refer for guidance to the Code of Professional Ethics 3
(including Rule of Conduct 101), and the generally accepted 4
auditing standards and MAS practice standards, as well as 5
to the GAO standards document and the AICPA audit guide, 6
"Audits of State and Local Governments." 7

Interpretive Comments on Professional Standards 8

Independence -- In the conduct of audit engagements, 9
a practitioner must be independent both in appearance 10
and in mental attitude. 11

The appearance of independence historically has been of 12
importance in a CPA's audit practice. While rules of 13
independence have not been as rigid with MAS practice, 14
the GAO indicates that the role to be fulfilled in these 15
expanded scope audits requires the same degree of inde- 16
pendence as for any financial audit engagement. ¹ There- 17
fore, if a CPA serves an entity of government or a grant 18
or loan recipient as a director or officer or in a 19
capacity equivalent to that of a member of management, 20
this could preclude him from conducting an evaluation 21
engagement for that entity. For example, if a practi- 22
tioner is on a school board, it would preclude him or his 23
firm from conducting an audit engagement to evaluate 24
economy, efficiency or program results as well as a 25
financial audit for that school district. 26

Specific Knowledge and Competence -- Practitioners per- 1
forming an engagement must have or obtain technical 2
competence in the analytical approach and process and 3
in the technical subject matter under consideration. 4
The analytical approach mentioned on page 22 is 5
important in all engagements regardless of the organi- 6
zation or function. In addition, if an electronic data 7
processing function is to be reviewed, the practitioner 8
should possess or obtain, prior to completion of the 9
engagement, adequate electronic data processing knowl- 10
edge and skills, including EDP administration, manage- 11
ment and organization. With respect to programmatic 12
areas, if, for example, some aspect of law enforcement 13
is to be reviewed, the practitioner should possess or 14
obtain the necessary understanding of the general 15
program area. 16

Due Care -- Due professional care is to be exercised 17
in the conduct of every aspect of expanded audit engage- 18
ments. The public will expect the same degree of care 19
and diligence with evaluations of economy, efficiency 20
and program results which CPAs have traditionally 21
brought to their work. 22

For example, in regard to an evaluation of the results 23
of a program to improve "response time" to an emergency 24

by a police department, the practitioner will be 1
expected to have satisfied himself as to the reliability 2
of the data used as a basis for the evaluation. 3

Engagement Understanding -- For any evaluation engage- 4
ment, the specific functional and/or programmatic areas 5
to be reviewed and reported on must be specifically 6
identified. 7

For a program results evaluation, a common understand- 8
ing of the related goals and objectives of the program 9
under examination must be reached by the contracting 10
parties. The evaluation criteria should be understood 11
by the contracting parties. In cases where a CPA is 12
participating directly in evaluation rather than re- 13
viewing management's assessment, the criteria should 14
be developed and accepted by the management of the 15
entity under review before field work on the evaluation 16
itself commences. If the practitioner finds that the 17
criteria necessary for the conduct of an effective 18
evaluation are lacking (i.e., criteria not acceptable 19
or not established), he should not proceed with the 20
evaluation until acceptable criteria are made available 21
by the entity's management. 22

When conformity with legal and regulatory requirements 23
is involved, the applicable constitutional, charter 24

or statutory requirements, as well as the administrative policies, rules and regulations against which the entity's actions are to be evaluated, should be made readily available by the entity for reference by the practitioner.

In cases where the entity cannot supply the practitioner with the materials needed to perform the evaluation (e.g., applicable laws and regulations, or evaluation criteria), the practitioner may agree to assist the entity in securing or developing whatever may be required when appropriate. These additional efforts may be handled either by negotiating an extension of the scope of the evaluation engagement or as a separate consulting engagement. This should be documented as part of the engagement understanding.

Sufficient Relevant Data -- Sufficient relevant data must be obtained, documented and evaluated before developing conclusions and recommendations. Early in an engagement, or preferably before commencing an engagement, the practitioner should exercise his professional judgment to determine the relevant type and amount of data required, as well as its availability.

For example, a mental health institution may have an objective of discharging 90% of its patients back to the community, successfully treated, within 90 days of admittance. The practitioner should ascertain the availability of data

to document findings relative to such an objective. 1
He should also determine whether and how he can 2
test the reliability and relevance of such data, 3
and thus, the resulting reported accomplishment 4
against the stated objective. 5

Communication of Results -- The results of the engage- 6
ment are to be communicated in a report to the client. 7
The report should include the basis for the find- 8
ings and recommendations of the practitioner with re- 9
spect to the specific functional or programmatic areas 10
under review. Conclusions and recommendations should 11
be reviewed with the client and with management of the 12
entity under review prior to a report being issued. 13
Differences of opinion should be reflected in the 14
final report. 15

Conclusion 16
These comments on the application of existing profes- 17
sional standards to expanded scope audit engagements in ac- 18
cordance with GAO standards are intended only to illustrate 19
situations where special care should be taken by the prac- 20
titioner. As always, professional judgment must be exercised 21
as to the application of professional standards to each new 22
situation. 23

APPENDIX A

GAO Audit Standards Supplement No. 6
Illustrative Report
Air Pollution Control Program, Sassafras County, MD.

The following pages reproduce the above titled GAO document. It should be noted that the illustrative report is also intended for the guidance of governmental audit agency personnel and may not comply in all respects to the standards under which a CPA would report.

ILLUSTRATIVE REPORT

Prepared in accordance with
the GAO audit standards

AUDIT STANDARDS
SUPPLEMENT
SERIES NO. 6

AIR POLLUTION CONTROL PROGRAM SASSAFRAS COUNTY, MARYLAND



BY THE COMPTROLLER GENERAL
OF THE UNITED STATES
1975

FOREWORD

On August 1, 1972, the United States General Accounting Office (GAO) issued "Standards for Audit of Governmental Organizations, Programs, Activities & Functions." These standards were developed for application at all levels of government in the United States.

OBJECTIVE OF GAO STANDARDS

A principal objective of the GAO standards is to stimulate State and local governments to improve the character and scope of audits of federally assisted programs. It is generally agreed that the Federal Government should rely, to the extent practicable, on audits undertaken by State and local governments to eliminate the duplicate audit coverage that results when Federal, State, and local auditors independently audit programs and activities without regard to the needs of the other levels of government.

RELATIONSHIP OF GAO STANDARDS TO AICPA STANDARDS

Because many State and local governments engage independent public accountants to audit their activities, the GAO standards have been of great interest to the public accounting profession. The scope and expected results of the audits contemplated in the GAO standards are perhaps the areas of greatest interest.

Some members of the public accounting profession have asked why GAO considered it necessary to publish auditing standards when the American Institute of Certified Public Accountants (AICPA) has had widely accepted auditing standards for many years and has a committee continually considering this subject.

For audits of financial statements, the AICPA standards were incorporated in the GAO standards. However, the GAO standards are broader and were developed primarily to cover additional areas of interest to government officials, legislators, and the public, as explained below.

The term "audit" or "auditing" is used in this report in the sense in which it encompasses the examination of financial operations and legal compliance, the review of economy and efficiency, and the review of program results.

AICPA cooperated in the development of the GAO standards. In November 1973 AICPA published "Auditing Standards Established by the GAO--Their Meaning and Significance for CPAs" which contained the following comment.

"The Members of this Committee [AICPA Committee on Relations with the General Accounting Office] agree with the philosophy and objectives advocated by the GAO in its standards and believe that the GAO's broadened definition of auditing is a logical and worthwhile continuation of the evolution and growth of the auditing discipline."

BROAD SCOPE AUDITS NEEDED FOR GOVERNMENT PROGRAMS

The objectives of governmental programs and activities are varied, dealing generally with promoting citizens' safety, health, and welfare. Therefore, measures of the effectiveness of government activities must focus on what the programs are intended to achieve and what they actually achieve with the resources used.

Moreover, since such programs are financed with taxpayers' funds, there is an accompanying need to know whether funds are properly safeguarded from loss, laws and regulations governing the use of these funds are followed, and those spending the funds achieved reasonable efficiency and economy in carrying out their work.

Responsible government officials must be held accountable in all of these areas. GAO's auditing standards therefore provide for audits of a broad scope, consisting of the following elements:

1. Financial and compliance--determines (a) whether financial operations are properly conducted, (b) whether the financial reports of an audited entity are presented fairly, and (c) whether the entity has complied with applicable laws and regulations.
2. Economy and efficiency--determines whether the entity is managing or utilizing its resources (personnel, property, space, and so forth) in an economical and efficient manner and the causes of any inefficiencies or uneconomical practices, including inadequacies in management information systems, administrative procedures, or organizational structure.

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3. Program results--determines whether the desired results or benefits are being achieved, whether the objectives established by the legislature or other authorizing body are being met, and whether the agency has considered alternatives which might yield desired results at a lower cost.

AVOIDANCE OF DUPLICATION IN AUDITING

As the Federal Government makes more funds available to State and local governments through specific-purpose grants and revenue sharing, its goals and objectives become more closely related to those of State and local governments. Local government officials and legislators want to know what particular programs are achieving at the local level; State officials and legislators want to know what these same programs are achieving on a State-wide basis; and Federal officials and the Congress want such information on a national basis. Citizens are interested in what is happening at all levels.

If an audit is to be made of a particular grant or similar activity in which more than one level of government is interested, it should be made with appropriate standards so the result will be useful to all interested parties. Such an approach should not only save the costs inherent in duplicate auditing but also make the examination and review processes more effective by making it possible for the auditor to gain a more complete understanding of the program he is auditing.

PURPOSE OF THIS ILLUSTRATIVE AUDIT

This illustrative audit was undertaken to demonstrate one type of situation where an audit of a local governmental activity could provide information needed at the local level and also deal with questions and issues of interest to the State and Federal levels of government.

This example is based on an audit made by a GAO regional office of the Air Pollution Control Program jointly funded by a local government and the Environmental Protection Agency (EPA). Because the audit is being used for illustrative purposes and the report will receive wide distribution, we have used a fictitious name for the local government audited.

The reporting concepts illustrated in this example are different from those commonly used by public accounting firms and most governmental audit organizations. This reporting approach is based on the assumption that the Federal agency furnished an audit guide to the grantee (the county) who contracted with the public accounting firm and that the public accounting firm was required to report

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back to the grantee, the State and the Federal agency the information developed and conclusions reached, if applicable, on each of the areas covered in the audit guide. Following this approach, both the program managers and auditors at the Federal level can consider the combined results of independent audits at several locations and thus gain a broader view of how the program is being carried out.

We do not contemplate that local governments would make audits of this scale annually for programs such as the Air Pollution Control Program. Auditing such programs on a 3- or 5-year cycle or performing audits of the programs of statistically selected State and local governments may be the better way of obtaining necessary information on many national programs.

Although auditors normally do not include the audit guidelines with their report or cross-reference their comments in the report to the audit guidelines, we have done so in this instance so that auditors and managers can relate the comments in the report with the audit guidelines used.

The design of reports on audits which cover examinations of financial operations and compliance with applicable laws and regulations, reviews of efficiency and economy of operations, and reviews of program results is a relatively new undertaking. This is particularly true where an audit at the local level is made--the results of which will be of interest to officials at that level as well as at State and Federal levels. Developing reporting techniques in this area will be an evolutionary process. This report is a start. GAO intends to publish other examples showing other approaches.

This report demonstrates the type of reporting contemplated by the GAO standards when programs at the local government level are to be audited according to Federal guidelines. GAO prepared the audit guidelines used (appendix I) after consulting EPA officials.

Thomas B. Staebler
Comptroller General
of the United States

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ILLUSTRATIVE REPORT

AIR POLLUTION CONTROL PROGRAM

SASSAFRAS COUNTY

MARYLAND



UNITED STATES GENERAL ACCOUNTING OFFICE
WASHINGTON, D.C. 20548

March 31, 1974

The County Council
Sassafra County, Maryland

Ladies and Gentlemen:

This report presents the results of our audit of the Sassafra County, Maryland, Air Pollution Control Program. Our audit was made in accordance with the GAO Standards for Audit of Governmental Organizations, Programs, Activities & Functions and included:

1. An examination of financial operations and legal compliance matters for the period from July 1, 1972, to June 30, 1973. (At the time of our audit, a local air pollution control ordinance had not been enacted and the transportation strategies required in the Maryland State Implementation Plan of 1973 had not been approved by the Environmental Protection Agency (EPA). Therefore, our review of the county's compliance with applicable laws and regulations was directed primarily to compliance with EPA regulations and grant requirements.)
2. A review of efficiency and economy of operations for the period from July 1, 1972, to December 31, 1973.
3. A review of program results for the period from July 1, 1972, to December 31, 1973.

Our audit included a study of (1) the county's applications for Federal grants under the Air Pollution Control Program, (2) the approved grants and expenditures associated with such grants, (3) the county's financial reports for the program for the fiscal year ended June 30, 1973, and reports of operations for the 18-month period ended December 31, 1973, (4) the Maryland State Implementation Plan of

1973, and (5) such other data considered necessary in the circumstances. We interviewed officials of the county's Air Pollution Control Section and Finance Department, the Maryland Bureau of Air Quality Control, the Metropolitan Council of Governments, and EPA.

The results of our audit are presented in the following chapters. (For ease of reference, sections of the report are numbered to correspond with the pertinent sections of the audit guidelines. See app. I.)

BACKGROUND

Under the 1967 Air Quality Act and the Clean Air Act of 1970, the Congress provided for technical and financial assistance for air pollution prevention and control programs at the State and local governmental levels. The Congress believes these levels of government should be responsible primarily for preventing and controlling air pollution at the sources, except for sources attributed to new motor vehicles for which the Federal Government has primary pollution control responsibility.

Since June 1968 Sassafras County has received Federal assistance from EPA to partially finance an Air Pollution Control Program which is part of the Maryland State Implementation Plan.

FINANCIAL OPERATIONS AND LEGAL COMPLIANCE

The annual report of expenditures we examined was for the fiscal year ended June 30, 1973. Our opinion thereon, which appears on page 11, is qualified to the extent that the salaries for certain personnel were charged to the program, even though the employees involved devoted part of their time to activities other than air pollution control. We estimate that such expenditures charged to the program for the fiscal year ended June 30, 1973, approximated \$1,900; about \$1,200 was reimbursed under the EPA grant. A determination as to whether

these costs will be allowable or unallowable under the grant must be made by EPA.

Because the grant stipulated that the people filling air pollution control positions would spend 100 percent of their time on air pollution activities, we recommended--and the county Director of Environmental Resources agreed--that the procedures should be revised so that the program would be charged only for the time personnel worked on it.

With respect to the county's compliance with applicable local, State, and Federal air pollution control laws, we found that:

1. At the time of our audit there were no local air pollution control laws, although a proposed local ordinance was then being considered by the County Council.
2. EPA had not approved the transportation control strategies required in the Maryland State Implementation Plan.
3. Sassafras County had complied with EPA's specified means of collecting and analyzing air samples except for a spectrophotometer which was different from the one EPA specified. The difference would have no significant impact on the quality of sample analyses.

ECONOMY AND EFFICIENCY

There are items of equipment on hand worth \$6,700 which are no longer needed or being used by the county. (See p. 21.) We are recommending that EPA consider whether the equipment could be used by some other grantees.

PROGRAM RESULTS

The county substantially achieved the intermediate abatement objectives set forth in the 1973 EPA grant, with the following exceptions.

1. According to the grant, the county was supposed to establish a program for controlling particulates from construction and material handling. Air pollution control officials said such a program had not been established because of a lack of agreement on the responsibilities of other county units, such as the Police Department and the Department of Public Works. (See p. 31.)

We recommend that the Council, while considering the county's proposed air pollution control ordinance, define clearly the responsibilities of the county units for enforcing the ordinance.

2. The county public school system must convert all of its school facilities from residual fuel oil or install particulate capturing equipment by October 1, 1974. As of March 31, 1974, the school system had not submitted a plan for compliance despite requests from the Air Pollution Control Section. (See p. 31.)

We recommend that the Council require the Superintendent of Schools to submit a fuel conversion plan as requested by the Air Pollution Control Section.

The emission inventories show that the county made some progress during 1973 in controlling particulates. However, carbon monoxide and photochemical oxidants levels in Sasafra County apparently are the major problems; the national air standards for carbon monoxide and photochemical oxidants are being exceeded at an increasing rate. (See pp. 37 to 39.)

These pollutants exceeded EPA air quality standards on 86 days during the 18-month period reviewed. The 1975 national air quality standards provide that applicable levels not be exceeded more than once a year for each pollutant.

Motor vehicles are the primary sources of carbon monoxide and photochemical oxidants, but the county exercises almost no control over that source of air pollution. The Federal Government is responsible for controlling pollution from new mobile sources, and the State is responsible for inspecting air pollution control devices on cars registered in Sasafra County.

The following conditions were observed with regard to the county's air pollution control activities.

1. Although the county had acquired EPA-specified air monitoring equipment which was in good working condition at the time of our audit, no samples were taken during significant periods in the 18-month period covered by our audit. (See p. 39.) County and State officials should closely examine this situation.
2. The county's report of operations for the program was inaccurate because it was incorrectly prepared and the Air Pollution Control Supervisor did not adequately review it. As a result, the number of times the air quality standards were exceeded was not accurately reported. County records showed 127 instances in which the standards were exceeded but not reported during the 18-month period. (See p. 39 to 41.) We brought this to the attention of the supervisor who agreed with our findings and promised that, in the future, the reports would be verified and reviewed more carefully to be sure that they are accurate.
3. Air pollution episode plans were not implemented in all cases when the levels of pollutants exceeded the minimum health requirements. When episode plans were implemented, the primary (often the only)

action taken was to warn the public of the danger. In general, available data indicates that the public did not respond to such warnings. (See p. 43.)

The Air Pollution Control Supervisor and the Director of Environmental Resources of Sassafras County and the Director of Audits, EPA, have reviewed this report. Their comments and suggested clarifications are included in the report.

In accordance with the memorandum of audit agreement, we are sending copies of this report to the Maryland State Department of Health and Mental Hygiene and to the Administrator, EPA.

Regional Manager
U.S. General Accounting Office



UNITED STATES GENERAL ACCOUNTING OFFICE
WASHINGTON, D.C. 20548

March 31, 1974

Administrator, Environmental
Protection Agency

Dear Sir:

Enclosed is a copy of our report to the County Council on the results of our audit of the Sassafras County, Maryland, Air Pollution Control Program. Our audit was made in accordance with the GAO Standards for Audit of Governmental Organizations, Programs, Activities & Functions.

We are forwarding this report to you because of your interest and responsibilities in this area. Your attention is invited particularly to pages 21 and 32 which contain recommendations to the Environmental Protection Agency.

A copy of the audit report is also being sent to the Director, Bureau of Air Quality Control, Environmental Health Administration, Maryland State Department of Health and Mental Hygiene.

Sincerely yours,

Regional Manager
U.S. General Accounting Office



UNITED STATES GENERAL ACCOUNTING OFFICE
WASHINGTON, D.C. 20548

March 31, 1974

Director, Bureau of
Air Quality Control
Environmental Health Administration
Maryland State Department of
Health and Mental Hygiene
Baltimore, Maryland

Dear Sir:

Enclosed is a copy of our report to the County Council on the results of our audit of the Sassafras County, Maryland, Air Pollution Control Program. Our audit was made in accordance with the GAO Standards for Audit of Governmental Organizations, Programs, Activities & Functions.

We are forwarding this report to you because of your interest and responsibilities in this area.

A copy of the audit report is also being sent to the Administrator, Environmental Protection Agency.

Sincerely yours,

Regional Manager
U.S. General Accounting Office

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REPORT ON AUDIT

AIR POLLUTION CONTROL PROGRAM

SASSAFRAS COUNTY,

MARYLAND

1. Examination of financial operations and legal compliance matters for the period from July 1, 1972, to June 30, 1973.
2. Review of economy and efficiency of operations for the period from July 1, 1972, to December 31, 1973.
3. Review of program results for the period from July 1, 1972, to December 31, 1973.

U.S. GENERAL ACCOUNTING OFFICE

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CHAPTER 1

FINANCIAL OPERATIONS AND LEGAL COMPLIANCE

A. OPINION ON FINANCIAL REPORT

Our examination of the annual report of expenditures of the county's Air Pollution Control Program for Grant No. 73A-3201-R2 for July 1, 1972, to June 30, 1973 (see p. 12), was made in accordance with generally accepted auditing standards,¹ and accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

During this period, salaries of certain personnel were charged to the program, even though the employees involved devoted part of their time to other activities. Such expenditures charged to the program for the fiscal year ended June 30, 1973, approximated \$1,900; approximately \$1,200 was reimbursed under the Environmental Protection Agency (EPA) grant. EPA must determine whether these costs will be allowable or unallowable under the grant.²

In our opinion, except for the matter described in the preceding paragraph, the following annual report of expenditures presents fairly the expenditures of the county's Air Pollution Control Program under Grant No. 73A-3201-R2 for the period from July 1, 1972, to June 30, 1973, in conformity with the finan-

¹Generally accepted auditing standards and the "Standards for Audit of Governmental Organizations, Programs, Activities & Functions" are the same insofar as examinations of financial statements are concerned; accordingly, either may be cited when giving opinions on financial statements.

²In the event numerous costs are questioned, the middle paragraph could be reworded to incorporate by reference a separate schedule of all the questioned costs.

Consequently, our compliance examination was directed primarily to checking the county's compliance with EPA's regulations contained in the grant for the period July 1, 1972, to June 30, 1973. We found no instances of the county's failure to comply with such terms and conditions, except as discussed in subsection 5 below. Our comments and observations on compliance matters follow.

3. Submission of expenditure report

The county submitted its annual expenditure report for the fiscal year ended June 30, 1973, on September 11, 1973, within the required 90 days after the end of the budget period. The report included supplemental schedules of project expenditures by budget category, as required.

4. Plan of scheduled activities submitted

On November 24, 1972, the county submitted to EPA a plan detailing the mutual responsibilities and scheduled activities of the county and the Maryland Bureau of Air Quality Control for the fiscal year ended June 30, 1973, as required.

5. Propriety of expenditures

In our opinion, Federal and non-Federal air pollution program funds were used for the purposes stated in the grant application and for those items in the approved budget, except for the matter discussed on pages 24 and 25, of paying program personnel for time devoted to activities other than air pollution control during the fiscal year ended June 30, 1973. On the basis of our recommendation, the county agreed to revise its procedures to insure that personnel costs are properly charged in subsequent fiscal years to the activities for which the personnel's time is spent.

6. Accounting cutoffs

In our opinion, proper accounting cutoffs and accruals of expenses were made at the end of the fiscal years ended June 30, 1972 and 1973, so that program funds were spent or obligated only during the period of the grant award.

7. Use of program funds

The county made no budget changes requiring prior EPA approval. Comments on specific items requested in the audit guide follow.

a. For the fiscal year ended June 30, 1973, county records show that there were no transfers of non-Federal funds which substantially altered the scope or purpose of the grant award.

b. County records also indicate that expenditures of Federal funds did not result in a cumulative increase in the total of any budget category of more than 25 percent, or \$1,000.

c. The county spent no Federal funds in a budget category other than those approved in the grant, and it did not buy equipment items costing more than \$1,000 each.

8. Federal reimbursement

The county obtained and spent the necessary non-Federal funds for the grant period so that appropriate matching ratio requirements were met.

Total program expenditures for the fiscal year ended June 30, 1973, were \$222,533, as shown by the accompanying financial

report. Pursuant to grant regulations (42 CFR 45 56.5 g), only non-Federal funds exceeding the previous year's non-Federal funds may be matched at a 3 to 1 ratio.

In the fiscal year ended June 30, 1972, the county's non-Federal costs (unaudited by GAO) were \$66,082. The county's (non-Federal) costs in the fiscal year ended June 30, 1973, were \$105,195. Applying the 3 to 1 ratio to the additional \$39,113 in non-Federal funds, the appropriate Federal share was \$117,338. A summary follows.

Non-Federal funds - 1973	\$105,195
Non-Federal funds - 1972	<u>66,082</u>
Additional non-Federal funds	39,113
Matching 3 to 1 ratio	<u>3</u>
Appropriate Federal share	<u>^a\$117,338</u>

^aMinor difference due to rounding.

9. Records of financial status

Monthly cumulative reports show the total cost of the activity and the amount by budget category supplied from Federal and non-Federal sources.

10. County complied with methods of measuring air quality specified by EPA

- We discussed the county's methods for monitoring and analyzing air quality with officials of the Maryland Bureau of Air Quality Control and the Quality Control Branch, Office of Air Monitoring, EPA. On the basis of our discussions, we believe the county was using EPA-specified methods to measure all pollutants.

- Officials of both the Air Pollution Control Section and the Maryland Bureau of Air Quality Control told us that no formal Maryland State evaluation had been made of the county's air monitoring and analysis methods before our review. According to these officials, however, Maryland does review and approve each fiscal grant application containing a detailed explanation of air monitoring and analysis methods. Although the State's review of and comments on the county air monitoring and analysis methods contained in the grant application is beneficial to EPA, a periodic inspection and report would be more reliable. State officials indicated such a procedure would be incorporated into a new State review system.

- The county used a spectrophotometer in laboratory analyses which was different from that recommended by EPA. According to county records, it would have cost \$2,800 to purchase a new spectrophotometer with the recommended band width.

- We brought this to the attention of EPA air monitoring officials who told us that the difference in band width between the two spectrophotometers would not have a major impact on the quality of sample analyses.

- The county measures all pollutants for which EPA has established primary and secondary standards, except hydrocarbons. Maryland monitors hydrocarbons at two county locations as a part of the Maryland-wide air quality monitoring system and furnishes data on hydrocarbon measurements to the county. In our opinion, this arrangement is acceptable

until the county obtains a hydrocarbon monitor.

- f. The county has budgeted funds for a total hydrocarbon methane air monitor but has not purchased this equipment. It is awaiting an EPA determination as to the equipment that will best serve this purpose; it then plans to request approval. This is as required by the approved grant.

CHAPTER 2

ECONOMY AND EFFICIENCY

A. EQUIPMENT AND SUPPLIES

1. Procedures for purchase of equipment and supplies

We interviewed county officials and examined equipment requisitions, purchase orders, receiving slips, and equipment inventory cards to determine the procedures followed to purchase equipment and supplies.

Equipment and supply needs are usually determined during the year, and necessary funds are requested in the budget for the next year. The Director, Division of Resources Protection, and the Director, Department of Environmental Protection, review the budget for need, technical merit, and resource availability. If unbudgeted equipment and supply needs arise during the fiscal year, the review procedure remains the same.

We noted no instances when unneeded equipment and supplies were purchased and concluded that these procedures were satisfactory.

2. Obtaining economical prices

We interviewed personnel in the Air Pollution Control Section and other county officials and reviewed their records to determine if procedures existed for purchasing equipment and supplies at economical prices.

The county purchasing division purchases all equipment and supplies. For purchases over \$2,000, competitive bids are solicited. The department director must justify to the county purchasing director reasons for not selecting the lowest bidder. The purchasing director told us that deadlocks, although rare, are resolved by the county attorney.

On the basis of personal experience and knowledge of local vendors, an air pollution control official recommends vendors for smaller items of equipment and supplies peculiar to air pollution. A county official said that a stock of the more common items was maintained to take advantage of quantity discounts.

The county's procedures appeared adequate for purchasing equipment and supplies at economical prices.

3. Equipment records

The supervisor of the Air Pollution Control Section keeps an equipment and supply "Kardex" file for all equipment and supplies the section purchases. At the time of our audit, equipment inventory was valued at about \$40,000.

Card files include such information as the dates received, costs, vendors, purchase order numbers, and serial numbers. Copies of requisitions are also on file. We tested the accuracy of these records and found no major errors.

4. No excess supplies

The Air Pollution Control Section uses about \$450 worth of supplies a month, \$250 of which is for chemicals and laboratory supplies. The value of inventory on hand was about \$1,100.

We compared monthly use rates with the stock of supplies on hand and concluded that supplies on hand were not excessive. Items usable only for air pollution purposes were ordered when needed.

5. Equipment condition and usage

Using the equipment records as a base, we verified the existence and condition of selected items of air pollution control equipment and found all to be in good condition. The semiannual report for the first 6 months of fiscal year 1974 indicated,

however, significant outages for three continuous monitors.

To determine if the equipment was being used, we examined summary sheets and log books used for readings and calibrations of equipment, observed the equipment in use, and discussed with its operator the purposes of each item.

Our analysis of air monitoring records showed significant periods when the equipment was not functioning. (See p. 39.) Although the equipment was in good working condition at the time of our audit, we believe that county and State officials should monitor the downtime more closely.

Two items purchased in 1970 were not being used: (1) a large total oxidant analyzer purchased for \$5,775 and (2) stack-testing equipment purchased for \$987. Updated equipment replaced the total oxidant analyzer in fiscal year 1973; discussions are in progress with State officials on how to best dispose of the analyzer.

The stack-testing equipment was purchased in fiscal year 1970 for proposed tests, but no stack testing has been made and none is contemplated. The Air Pollution Control Supervisor told us that stack testing would require more equipment and personnel experience than is available and that the Maryland Bureau of Air Quality Control could make stack tests if needed. He intends to keep the equipment since it may be used at a later time. He did not agree to report it to EPA as excess equipment.

Recommendation

We recommend that EPA consider whether this excess equipment could be used by some other grantee.

B. TESTING

1. Economy in testing methods

According to the supervisor, technical merit, rather than economy, primarily determines the best method for collecting and testing samples. An official of EPA's Office of Air Monitoring agreed and said that the first consideration must be which method will best satisfy the need since there are differences in accuracy, response times, and other technical factors.

Although we agree that technical merit must be a prime consideration, economy of price and operation should be reviewed and considered in each equipment purchase.

2. Factors considered in air-sampling locations

The Air Pollution Control Supervisor told us that he had used the factors specified in EPA's "Guidelines: Air Quality Surveillance Networks," in deciding the number and placement of sampling stations. These factors included high population densities, meteorology, topography, present and projected land uses, and pollution sources. He based his decisions on knowledge of EPA guidelines, his personal experience, public demands for information, and consultations with Maryland officials.

We obtained a map locating all stations and describing the characteristics of each area, such as its population density, whether it is a commercial or residential district, etc. We visited 9 of 13 stations and verified the locations and descriptions and found the stations to be as described. In our opinion, the county had followed the "Guidelines: Air Quality Surveillance Networks."

3. Calibration of equipment

To determine whether sampling and analytical instruments had been calibrated before installation

and routinely thereafter, we examined the records for two of three continuous monitors and interviewed the individual generally responsible for their calibration. According to the records, both monitors were calibrated before installation, checked daily for accuracy, and calibrated thereafter as necessary. The individual responsible for manual sulfur dioxide and nitrogen dioxide monitors said that the only calibration required was that of the needle orifice. He said that this calibration was performed weekly in the laboratory. We were also told that particulate samplers were calibrated every 2 to 3 months when the motors are rebuilt.

C. PERSONNEL

1. Staff qualifications

We reviewed the files of all personnel assigned to the Air Pollution Control Section to determine whether they met the minimum qualifications in EPA's "Guide Class Specifications for Air Pollution Control Programs in State and Local Programs." Table 1 lists positions in the fiscal year 1973 and 1974 grant applications. We found no cases in which the personnel involved failed to meet experience qualifications.

Table 1			
Positions in Fiscal Years 1973 and 1974 Grant Applications (note a)			
Position	1973	1974	
Air pollution supervisor	1	1	
Sanitarian III	1	1	
Environmental health engineer II	1	1	
Sanitarian II	2 (1)	2 (1)	
Environmental inspector II	1 (1)	1 (1)	
Environmental inspector I	9 (2)	9	
Laboratory scientist	1	1	
Clerk typist	2 (1)	1	
Secretary	1	1	
Total	12 (5)	12 (2)	

a Vacancies as of June 30, 1973, and December 31, 1973, in parentheses.

2. Salary determination

According to the county personnel office wage and salary specialist, who is generally responsible for establishing staff salaries, county salaries are derived from wage surveys and a number of outside references, including the annual Local Government Personnel Salary Survey. We compared the salaries for positions in the Air Pollution Control Section with salaries for similar positions, such as health and water quality inspectors, in Sassafras County and found that they were comparable.

3. Personnel controls

We interviewed air pollution control officials and reviewed records to determine whether controls were in effect to insure that staff members were on the job and performing their assigned duties. Inspectors keep daily logs and maintain contact with the office by two-way radio. The rest of the air pollution control personnel work in the county office.

We reviewed activity summaries for fiscal year 1973 and for the first half of fiscal year 1974 to determine whether staff members were devoting full time to the program. The activity summaries show that staff members spent (1) 163 hours, costing about \$800, in April 1973 on a solid waste survey and (2) 240 hours, costing about \$1,100, in May and June 1973 on such matters as rubbish and weed control and shopping center inspections. We concluded that it was not proper to charge personnel costs of about \$1,900 to the program which shared costs with EPA.

In view of these questionable charges to the program in 1973, we also reviewed the procedures and time summaries applicable to the first 6 months of fiscal year 1974.

The semiannual report for the first half of fiscal year 1974 indicates that one inspector spent

100 percent of his time on solid waste activities and that three others spent approximately 27 percent of their time on solid waste activities.

Recommendation

Because the fiscal year 1974 grant stipulated that the people filling positions would spend 100 percent of their time on air pollution control activities, we recommended that the county revise its procedures so that the program would be charged only for the time of personnel working on that program. The county indicated that when it claimed reimbursement from the Federal Government for 1974, only actual hours spent on air pollution control would be included.

We recommend also that, in the future, the county indicate in its grant applications and the claims for reimbursement the percentages of time each employee spends on air pollution control activities. The Sassafras Director of Environmental Resources said this would be done. EPA Region III officials told us that a determination would be made as to allowability of these costs under Sassafras County's grant.

4. Staff travel

Air pollution control travel expenses for the year ended June 30, 1973, were \$11,251; \$10,338 was local travel. Mileage at the rate of 9 cents for sedans and 15 cents for vans was charged to the program. The Sassafras County Motor Pool furnished vehicles for all local travel.

To determine whether staff travel was program related and approved and whether costs were reasonable, we examined the travel requests for fiscal year 1973.

In fiscal year 1973 the Air Pollution Control Supervisor, with prior approval by the department director and the county chief administrative

officer, attended the annual Air Pollution Control Association meeting at Miami Beach from June 18 to June 22. Actual daily expenses averaged \$38.67.

The air pollution control engineer, with county officials' approval, attended EPA's training course entitled "Control of Gaseous Emissions" at Durham, North Carolina, January 24 to 28, 1973. Average daily expenses were less than \$25 a day.

County travel guidelines state that reasonable actual costs incurred on program-related travel will be reimbursed. We believe that the travel cited above, in addition to all other travel audited, was program related and that costs were reasonable.

5. Staff training

We reviewed the training files and the travel vouchers of air pollution control personnel to determine whether staff training was job related.

In one case the relevance of the staff training to air pollution control appeared questionable. The enforcement chief attended a 2-day course at The George Washington University entitled "Solid Waste Management for Hospitals."

Regarding the relation of the course to air pollution control, the department director said:

"State air pollution regulations controlling emissions from incinerators at hospitals and nursing homes will require significant changes in solid waste disposal practices at these facilities. This course will provide the attending staff member with a better understanding of current practices and alternatives."

Since hospital solid wastes are burned in incinerators, we concluded that the training was program related.

Two individuals attended the bureau's 3-1/2-day training course on the various aspects of the State air monitoring system. The only other training in fiscal year 1973 was a 3-day course on visible emissions given at the University of Maryland for air pollution inspectors.

We concluded the \$965 spent on training was program related.

CHAPTER 3

PROGRAM RESULTS

The principal activities of the county's Air Pollution Control Program are air pollution abatement and air monitoring. The goals of the air pollution abatement activity, as stated in the approved grant and report of operations, are to

- effect controls over pollutant emissions from sources specified in State and county air pollution control regulations and
- encourage the elimination or control of unnecessary or excessive air pollution emissions from human activities in the county.

The purpose of the air monitoring activity is to obtain the necessary ambient air quality data so that

- the effectiveness of the abatement program can be measured,
- necessary abatement actions can be taken where ambient air quality levels indicate excessive concentrations, and
- timely actions can be instituted when ambient air concentrations exceed minimum health-related standards.

To assess county progress related to the above goals, we reviewed the activity reports and the supporting records of the Air Pollution Control Section from July 1, 1972, to December 31, 1973. We also reviewed the county's progress toward achieving the specific objectives set forth in the fiscal year 1973 Federal Air Pollution Control Program grant.

The results of our review of the effectiveness of the county's program and its monitoring and abatement activities follow. In reviewing the county's

efforts, it should be noted that in 1973 between 87 and 99 percent of air pollutants in Sassafras County originated from sources controlled by either the State or the Federal Government. Thus, the over-all impact of the county's pollution control efforts are limited.

A. ACTIONS TAKEN BY SASSAFRAS COUNTY TO REDUCE AIR POLLUTION

The reduction of atmospheric pollution to the lowest possible levels within given economic constraints is one of the county's principal objectives stated in the EPA grant. To accomplish that objective, several intermediate objectives to be accomplished during 1973 and 1974 were specified in the grant applications. The intermediate abatement objectives and our comments on the county's progress in meeting those objectives follow.

1. Registration and review of all existing sources

One objective was to register significant existing sources of pollution in the county by fiscal year 1973. As part of the cooperative agreement, under the Maryland State Implementation Plan, Maryland has requested that the county review all registered sources annually to insure compliance with registration requirements. The county reported in the fiscal year 1974 semiannual report that 2,100 sources had been registered by the end of fiscal year 1973. The Air Pollution Control Section and the State consider this to be all existing sources. In the first half of fiscal year 1974, 926, or 44 percent, of the registered sources were reinspected. Sassafras County reported that all sources would be visited before April 1974.

We reviewed the registration forms of those sources which had been reinspected and discussed the procedures with inspectors. We concluded that the reinspections had been effective in identifying changes in equipment and violations of regulations.

When violations were noted, followup visits were conducted and recorded to insure compliance.

2. Incinerator closures

The grant stated that the county would order closure of all incinerators violating Maryland regulations in 1973 and 1974. By the end of 1973, 502 owners or operators had been directed to cease incinerator operations. At December 31, 1973, 42 private incinerators and 13 government incinerators were still operating. Most of these were expected to be phased out either by orders originating from violations or by the July 1974 required phaseout date. Approximately 15 incinerators were to remain in operation after July 1, 1974. These were hospital, pathological, or animal crematory types of incinerators which are permitted by EPA regulations.

3. Open burning permits

The grant specified that the county would tighten restrictions on open burning permits and minimize land clearing open fires. The number of open burning permits issued in fiscal year 1973 decreased 21 percent from the number issued in the previous year.

We compared selected declined permits in 1973 with approved permits in 1972 and noted that similar permits which had been approved the previous year were disapproved in 1973.

The county anticipated that after July 1974 there would be a drastic reduction in approved permits due to a Maryland regulation which would increase from 200 to 500 yards the distance requirement between the fire and the nearest occupied structure or heavily traveled public road.

4. Control of particulates from construction and material handling

The county indicated in the fiscal year 1973 grant that a program was to be established for controlling particulates from construction and material handling. Dust and other materials originating from construction projects, unpaved roads, truckloads, and industrial operations continue to be major problems. The Air Pollution Control Section has attempted to define the responsibilities of the Police Department, the Department of Public Works, and the Air Pollution Control Section in obtaining compliance with various portions of the proposed county air pollution control ordinance. However, as of the end of 1973, no final agreement had been reached and the condition remained unchanged.

Recommendation

We recommend that the Council, in its consideration of the proposed air pollution control ordinance, define clearly the responsibilities of the county units for enforcing the ordinance.

5. Fuel conversions

Another intermediate goal specified in the grant was to initiate fuel oil and fuel burning equipment changes at schools and other large installations.

The Air Pollution Control Section reported that the abatement unit contacted all users of residual fuel oil and coal who were required to make conversions or add equipment before October 1, 1973. According to the fiscal year 1974 semiannual reports, all facilities were in compliance as of December 31, 1973. A total of 233 conversions to either natural gas or distillate oil were required and occurred through 1973.

The county public school system must convert all of its school facilities from residual fuel oil or install particulate-capturing equipment by

October 1, 1974. As of March 31, 1974, the school system had not submitted a plan for compliance despite Air Pollution Control Section requests.

Recommendation

We recommend that the Council require the Superintendent of Schools to submit a fuel conversion plan, as requested by the Air Pollution Control Section.

6. Major source testing

The grant application indicates that by fiscal year 1973, 30 percent of the major sources would be tested for compliance with emission regulations.

According to the fiscal year 1974 grant application, there are nine major sources of pollution in Sassafra County and only one of the required three sources had been tested as of December 31, 1973.

County officials had requested that the major sources be tested by State officials under the cooperative agreement included in the State Implementation Plan. State officials indicated that the testing teams were behind schedule but would be catching up in the next 6 months.

Since the county does not have the expertise or all the equipment to conduct these source tests, it must rely on the State to satisfy this portion of the grant objectives.

Recommendation

We recommend that EPA review the State testing schedule to insure that major source testing is accomplished in line with local program grant objectives. Without major source testing, emission standards could be violated without detection and correction.

B. IMPACT OF PROGRAM AS SHOWN BY EMISSION INVENTORIES

Trends in emission inventories indicate the effectiveness of air pollution control activities. EPA's "Guide for Compiling a Comprehensive Emission Inventory" states that:

"The proper emission control strategy for a specific air pollution problem is dependent upon an adequate assessment of the nature and extent of the pollution in the region involved. This assessment includes a review of existing levels of pollutants, the sources and their emissions, the techniques available for their control, and the probable increase in source emission resulting from urban and economic growth. The emission inventory indicates the major contributors (motor vehicle, industrial, etc.), and this information, in turn, directs the thrust of control efforts. * * * If the emission inventory is updated annually, a decrease in emissions should be reflected over a period of years. This decrease would then be a measure of the effectiveness and success of the control and could be used to indicate areas where program modification would be useful."

1. Emission inventory trends

Emission inventories are calculations of tons of pollutants emitted into the atmosphere for an entire year for a given geographical area. Calculations are based on fuel consumption and processes which contribute to each type of pollutant. The following table shows the emission inventories from all significant sources calculated by Sassafra County at December 31, 1970, the first period for which such inventories were available and the inventories at December 31, 1972 and 1973.

Table 2

County Emission Inventories

	1970	1972	1973
	(tons)		
Particulates	6,652	7,951	10,866
Sulfur oxides	67,591	72,596	48,906
Hydrocarbons	72,597	48,783	56,316
Nitrogen oxides	37,246	40,334	44,431
Carbon monoxide	397,023	310,587	335,744

County officials told us that beginning with 1970 the inventories for each of the years were complete and that the composition of pollution sources had not changed significantly.

The inventories show that pollution decreased between 1970 and 1973 for the following pollutants: sulfur oxides, hydrocarbons, and carbon monoxides. The inventories show, however, that two pollutants (particulates and nitrogen oxides) increased between 1970 and 1973.

2. Sources of air pollution

County officials attributed the increase in particulates to emissions from a public utility power plant. Under its Implementation Plan, Maryland is solely responsible for obtaining compliance of power-generating sources in the State. Maryland's Implementation Plan contains an order of the Maryland Secretary of Health and Mental Hygiene to the Sasfras Electric Power Company which requires the company's county generating station to meet specified conditions and schedules and to report directly to the Maryland Bureau of Air Quality Control.

State officials told us that the power company had submitted a compliance plan and that the company was complying with the plan. State officials were

aware of the emission impact of the plant and were closely monitoring it.

The county officials attributed the increase in nitrogen oxides to emissions from (1) the same power-plant and (2) motor vehicles over which the Federal Government has primary responsibility for pollution control.

The table below shows, for December 31, 1972 and 1973, the extent that the county was responsible for controlling the pollution sources. The percentages are based on emission inventories prepared by Sasfras County.

Table 3

	Particulates	Sulfur oxides	Hydrocarbons	Nitrogen oxides	Carbon monoxide
(percent)					
POLLUTANTS IN 1972: Sources under the control of the county:					
Power generation	68	94	1	37	99
Power (one plant)	13	1	97	57	99
Mobile sources	81	95	98	94	99
Subtotal					
Sources under the control of the county	19	1	2	6	1
Total	100	100	100	100	100
POLLUTANTS IN 1973: Sources not under control of the county:					
Power generation	77	92	1	39	99
Power (one plant)	10	2	97	55	99
Mobile sources	87	94	98	94	99
Subtotal					
Sources under the control of the county	13	6	2	6	1
Total	100	100	100	100	100

The above table shows that, in 1972, the power-plant and motor vehicles--for which air pollution control are the responsibility of the State and Federal Government--accounted for between 81 and 99 percent of the five pollutants in the county. In 1973

those sources accounted for between 87 and 99 percent of the pollutants.

Pollution sources for which the county is responsible accounted for 1 to 19 percent of the pollutants in 1972 and 1 to 13 percent in 1973, with the largest percentage applying to particulates. Thus, of the county efforts, those directed at controlling emissions of particulates have the greatest impact on improving air quality. This is due primarily to the county's efforts to close incinerators and convert coal and residual oil furnaces to cleaner sources of energy.

As shown below, the tons of particulates emitted from sources for which the county is responsible decreased during 1973.

Table 4

	1972	1973
Emission inventory, particulates in tons	7,951	10,866
Emissions (percent) from sources for which the county has responsibility	19	13
Particulate emissions from those sources (tons)	1,511	1,413
Decrease in 1973 (about 7%)		98

C. QUALITY OF AIR

National primary ambient air quality standards define levels of air quality which the Administrator of EPA judges are necessary, with an adequate margin of safety, to protect the public health. EPA established standards which include the following:

National Air Quality Primary Standards

Pollutant	Concentration - period	Frequency not to be exceeded
Sulfur oxides	a .14 ppm - 24 hour average	Once a year
Particulates	b 260 mg/m ³ - 24 hour average	Once a year
Carbon monoxide	9 ppm - 8 hour arithmetic average	Once a year
Photochemical oxidants	.08 ppm ozone - hourly average	Once a year
Nitrogen dioxide	.05 ppm - annual arithmetic average	Yearly average not to be exceeded

^aParts per million.

^bMilligrams a cubic meter.

Photochemical oxidants are the result of chemical reactions which take place in the atmosphere between nitrogen oxides and hydrocarbons under the influence of sunlight. The amount of hydrocarbons in the atmosphere limits the maximum amount of photochemical oxidants which can be formed.

1. Standards exceeded in Sassafras County

Our comparison of the EPA standards and the samples taken by the county during fiscal year 1973 and the first half of fiscal year 1974 are presented in table 5 on the following page.

Because the standard for photochemical oxidants is for 1-hour periods, it is possible for the standard to be exceeded up to 24 times in 1 day. To

properly gauge the quality of air in a given location, it is necessary to know both the number of times and the number of days standards were exceeded.

Table 5

	Number of times primary standards were exceeded	Number of days on which standards were exceeded
Fiscal year 1973:		
Particulates	-	-
Sulfur oxide	-	-
Nitrogen oxide	-	-
Carbon monoxide	24	24
Photochemical oxidants	66	17
Subtotal	90	41
First half of fiscal year 1974:		
Particulates	-	-
Sulfur oxide	-	-
Nitrogen oxide	-	-
Carbon monoxide	17	17
Photochemical oxidants	106	28
Subtotal	123	45
Total	213	86

As shown, the primary standards for carbon monoxide and photochemical oxidants were exceeded 86 days during the 18 months. The standards were exceeded more during the first half of 1974 than during the entire 1973 fiscal year.

The Metropolitan Council of Governments' news releases indicate that emissions from mobile sources in conjunction with adverse meteorological conditions were the probable reason the standards were exceeded. As indicated previously, pollution control responsibility for new mobile sources is assigned to the Federal Government.

Records of air quality monitoring data showed that readings were not taken on several days because equipment was being calibrated or had malfunctioned. On other days readings were not taken every hour. The following table shows the extent that the data shown in table 5 is incomplete.

Table 6

	Number of days during which monitors were calibrated or malfunctioned	Total hours for which no samples were taken	Percent of hours with no data
Fiscal year 1973:			
Carbon monoxide	88	1,452	21.1
Photochemical oxidants	240	2,619	29.9
First half of fiscal year 1974:			
Carbon monoxide	43	624	14.3
Photochemical oxidants	56	917	21.0

If standards for carbon monoxide or photochemical oxidants were exceeded during these periods, no record was made. Instances of standards being exceeded therefore may have been more than shown in table 5.

2. Instances of standards exceeded not reported by the county

The county's report of operations for fiscal year 1973 and its semiannual report for the first 6 months of fiscal year 1974 reported the number of times pollutant levels exceeded ambient air quality standards as follows.

Table 7

Reported number of times standards were exceeded

Pollutant	Fiscal	
	Year 1973	First half fiscal year 1974
Carbon monoxide	19	10
Photochemical oxidants	31	26
Total	50	36

As may be seen by the following comparison, Sassafras County did not report 127 instances of the standards being exceeded during the 18-month period.

Table 8

Comparison of actual with reported instances of standards exceeded

	First half fiscal	
	Year 1973	Year 1974
Actual recorded instances of standards being exceeded:		
Carbon monoxide	24	17
Photochemical oxidants	66	106
Total	90	123
Reported instances of standards being exceeded:		
Carbon monoxide	19	10
Photochemical oxidants	31	26
Total	50	36
Unreported instances of standards exceeded	40	87
		127

Of even greater importance, the reported instances made it appear as though the efforts at controlling air pollution in Sassafras County in the first half of fiscal year 1974 were much more effective than they had been. Standards had been exceeded a greater number of times in the first half of fiscal year 1974 than in all fiscal year 1973.

The county explained that this occurred because summaries prepared by the environmental health engineer were erroneous and the Air Pollution Control Supervisor did not verify the reports before publication. To the extent that we could determine, the errors by the engineer were simply inadvertent arithmetic errors.

Recommendation

We brought this to the attention of the Air Pollution Control Supervisor and recommended that future reports be reviewed more carefully. The supervisor agreed with our findings and promised that, in the future, the reports would be reviewed carefully to be sure that they are accurate.

We also recommended that the county fully comment on this situation in its report to the State on compliance with the State Implementation Plan and the report to EPA on status of the program. The Air Pollution Control Supervisor agreed and the next report of operations will contain comparative statistics.

3. Actions taken when pollution reached danger levels

Maryland's Implementation Plan contains an air pollution episode plan designed to control pollutant emissions during periods of poor atmospheric ventilation and rising levels of pollution concentrations where danger is imminent regarding human health. The Maryland State Implementation Plan also recognizes a regional air pollution episode plan adopted by the Metropolitan Council of Governments. Both plans specify one forecast and three action stages based on episode criteria recommended by EPA.

Effects of episode plans

In our judgment, the only major actions taken were news releases made by the Council. The releases informed citizens of the air pollution situation and advised the elderly and persons with heart, respiratory, and other conditions sensitive to air pollution to stay indoors. Since the concentration of pollutants came mainly from motor vehicle exhausts, commuters who usually traveled to work by automobile were urged to form carpools or use public transportation.

The county did not have data to indicate whether persons with heart, respiratory, or other conditions complied with the county's advice. The Council has indicated, however, that there was a general lack of response to news releases requesting persons to form carpools or use public transportation. On the days of episodes, there were no major increases in public transportation ridership.

Prospects of meeting 1975 goals

Although Sassafras County has met many of its intermediate abatement goals, the national air standards for carbon monoxide and photochemical oxidants are being exceeded at an increasing rate. Since the sources of these pollutants are not effectively under county control, the county will be forced to rely on actions by the State and Federal air pollution control agencies. Unless there are dramatic changes in the efforts of these agencies, the prospects of the air pollution standards being met in Sassafras County by 1975 are not good.

According to statements of responsibility in the two episode plans, either the Council or Maryland would initiate episode plan action for the county.

County records show that during the 18 months reviewed, the episode criteria were exceeded on 33 days; however, records of the Maryland Bureau of Air Quality Control and the Council showed that episode plans were put into effect on only 9 of those days.

According to a Council official, the Council does not initiate an episode alert unless the criteria are exceeded in more than one jurisdiction. The Council obtains hourly readings of pollutants for each jurisdiction. However, records were not kept for the period we audited. We did not review air monitoring data in other jurisdictions to determine whether the episode criteria were exceeded in other jurisdictions on the same days that they were exceeded in Sassafras County.

An official of the Air Pollution Control Section told us that Sassafras County increased monitoring activities, contacted all holders of open burning permits, and told police and fire departments of bans on open burning and insecticide and herbicide spraying. Sassafras County also participated in conference calls with the Council and Maryland officials. The county did not notify incinerator operators because the incinerators are not major sources of the pollutants which exceeded primary standards.

The county did not call all sources required by Maryland to submit a standby emission reduction plan. According to county officials, this action was not taken because the State Secretary of Health and Mental Hygiene has not formally approved any of the plans. Maryland officials said that, even if these plans had been approved, the conditions in the county would not have caused the plans to be implemented.

GUIDELINES FOR AUDIT

OF

AIR POLLUTION CONTROL PROGRAMSASSAFRAS COUNTY, MARYLANDI. INTRODUCTION

Under the 1967 Air Quality Act and the Clean Air Act of 1970, the Congress provided for technical and financial assistance to support air pollution prevention and control programs at the State and local levels on the belief that prevention and control of air pollution at its source is the primary responsibility of these governments. Since 1968 SassafRAS County has received Federal assistance from EPA to finance an Air Pollution Control Program. SassafRAS County's plan of operation is a part of the Maryland State Implementation Plan. A Federal requirement specifies that the plan be implemented by 1975.

The purpose of this audit is to evaluate all aspects of SassafRAS County's Air Pollution Program: financial statements and compliance, economy and efficiency, and program results.

II. FINANCIAL REPORT AND COMPLIANCEA. OPINION ON FINANCIAL REPORT

Determine whether the program's expenditure report is fairly presented and give an appropriate opinion.¹

¹Financial audit procedures should be more encompassing but, for purposes of this illustration, they have not been expanded.

As part of this examination, the auditor should evaluate the system of internal controls and consider the results of that evaluation in determining the extent that transactions should be tested.

The auditor should also determine what other audits have been made of air pollution control activities in the county and whether any part of such audits can be used for purposes of this audit.

B. COMPLIANCE WITH APPLICABLE LAWS AND REGULATIONS

1. Determine whether a local air pollution control ordinance has been passed and, if so, whether the county is complying with its provisions.
2. Determine whether EPA has approved the transportation control strategies in the State Implementation Plan. If so, determine whether the county has complied.
3. Determine whether SassafRAS County submitted the required annual expenditure report within 90 days after the end of the budget period.
4. The fiscal year 1973 grant application specifies that support beyond December 1972 was contingent upon submission by November 30, 1972, of a plan detailing the program's scheduled activities. Determine whether this condition was complied with.
5. Determine whether program funds, Federal and non-Federal, were used only for the purposes stated in the grant application and for those items enumerated in the approved budget.
6. Determine whether proper accounting cutoffs and accruals were made so that program funds were spent and/or obligated only during the budget period covered by the award.

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- a. Determine whether the methods specified by EPA are used by Sassafras County for monitoring and analyzing air quality.
- b. Determine whether the Maryland air pollution agency evaluates Sassafras County's methods of air quality measurement for compliance with EPA specified methods.
- c. Cite those instances where Sassafras County's methods are different from EPA's prescribed methods.
- d. Where Sassafras County uses other than an EPA prescribed method, obtain an expert opinion as to the validity of the measurement that was obtained using the alternate methods.
- e. If Sassafras County does not measure all six pollutants, determine why the pollutants are not being measured and if there are plans to measure them in the future.
- f. If a total hydrocarbon-methane air monitor was purchased in whole or in part with Federal funds, determine whether prior approval was obtained from EPA.

III. ECONOMY AND EFFICIENCY

A. EQUIPMENT AND SUPPLIES

1. Determine whether procedures exist to preclude purchase of other than needed equipment and supplies.
2. Determine whether procedures exist to promote purchase of equipment and supplies at economical prices.
3. Determine whether equipment records are maintained and, if so, comment on their accuracy.

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7. Determine whether Sassafras County obtained prior approval of EPA for budget changes involving:
 - a. Transfer of non-Federal funds that would substantially alter the scope or purpose for which the grant award was made.
 - b. Expenditures of Federal funds that would result in a cumulative increase in the grant total of any budget category of more than 25 percent, or \$1,000, whichever is greater.
 - c. Expenditures of Federal funds that would be made in a budget category for which no funds were approved.
 - d. Acquisition of any item of equipment costing in excess of \$1,000 which was not specifically enumerated in the approved grant application and which is wholly or partly supported by Federal funds.
8. Determine whether Sassafras County obtained the necessary non-Federal funds for the grant period and spent such funds so that appropriate non-Federal/Federal matching ratio requirements were attained.
9. Determine whether fiscal records show on a current basis the amount and disposition of Federal funds received, the total cost of the activity in connection with which such funds were provided, and the amount of that portion of the cost of the activity supplied by non-Federal sources.
10. EPA has established primary and secondary standards for measuring ambient air quality. The standards are set for six pollutants as are the methods for measuring their presence in the air. For the standards and methods, refer to the following paragraphs of Federal Register Vol. 36, No. 84, Part II, April 30, 1971. In regard to the measurement of air quality:

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4. Determine whether excess supplies are on hand.
5. Physically verify the existence of a representative number of items and determine whether the items are in good working order and in use.

B. TESTING

1. Determine what basis Sassafras County used to choose its methods of collecting and testing air samples and what consideration was given to economy in making that choice.
2. In decisions regarding the number and placement of sampling stations, determine whether Sassafras County considered factors specified in, "Guidelines: Air Quality Surveillance Network," EPA, May 1971.
3. Determine whether sampling and analytical instruments were calibrated before installation and routinely thereafter.

C. PERSONNEL

1. Determine whether the program's staff meets EPA's minimum qualifications in its publication "Guide Class Specifications for Air Pollution Control Positions in State and Local Programs," July 1971.
2. Determine the procedures for establishing staff salaries.
3. Determine whether controls are in effect to insure that staff are on the job and performing their duties. For any staff not devoting full time to the program, determine whether procedures are adequate to insure that the portion of time charged to the program is reasonable.

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4. Determine whether staff travel was program related, whether proper prior approval was obtained, and whether costs appear reasonable. Use \$25 a day as a basis for judging the reasonableness of per diem costs. Report instances where this amount was exceeded.

5. Determine whether staff training was job related. ✓

IV. PROGRAM RESULTS

- A. Determine whether Sassafras County has achieved its intermediate abatement objectives as stated in 1973 grant application. Specifically, determine the objectives and accomplishments in regard to:

1. Registration and review of existing sources.
2. Incinerator closures.
3. Open burning permit issuances.
4. Construction and material handling controls.
5. Fuel conversions.
6. Major source testing.
- B. Determine whether Sassafras County is achieving its goals of reducing air pollution:
 1. Obtain and report inventories calculated for pollutant emissions at the end of 1972 and 1973, and compare with the earliest inventories available to determine changes in pollutant levels.
 2. Obtain and report on the percentage of the sources that are controllable by Sassafras County and those noncontrollable by the county at the end of fiscal years 1972 and 1973.

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C. Determine whether there have been any instances where pollution levels in Sassafraz County have exceeded EPA's primary National Ambient Air Quality Standards. If so:

1. For the 18 month period ended December 31, 1973, determine the number of days in which a primary standard has been exceeded identifying the pollutant(s) and the cause or probable cause of the high pollutant level and whether these instances were appropriately reported.
2. Determine whether the instances when the standards were exceeded were properly reported.
3. Determine whether the Maryland Air Pollution Episode Plan was put into effect when applicable criteria were exceeded. Determine if there were differences between actions specified in the Plan and actual actions taken. Obtain explanations for any deviations from the plan.

APPENDIX B

Selected Subject-Oriented Reference List

Much has been written that relates to the subject matter discussed in this publication. In the following listing, the practitioner will find references that offer further illumination of many of the elements of the still evolving art of evaluating economy, efficiency and program results. Some references are more technical, some are more philosophical. They are listed by subject groupings, stressing the title rather than author to facilitate a quick review of the listing to find material on a specific topic.

While the list is extensive, it is also selective in that much more has been published on these subjects. As a key reading list, the following are suggested:

- Standards for Audit of Governmental Organizations, Programs, Activities and Functions, U.S. General Accounting Office, 1972.
- Questions and Answers on the Standards for Audit of Governmental Organizations, Programs, Activities and Functions, U.S. General Accounting Office, September 1974.
- Auditing Standards Established by the GAO: Their Meaning and Significance for CPAs, AICPA, 1973.
- Audits of State and Local Government Units, AICPA, 1974.
- Management or Operational Auditing by Elmer B. Staats, Comptroller, General of the United States, GAO Re-

- view, Winter 1972, pp. 25-35. 1
- The Auditor Takes on Program Evaluation by Ellsworth 2
H. Morse, Jr., Assistant Comptroller General of 3
the United States, The Federal Accountant, June 1973, 4
pp. 4-13. 5
 - Measuring the Effectiveness of Basic Municipal Ser- 6
vices, The Urban Institute and International City 7
Management Association, February 1974. 8
 - Practical Program Evaluation for State and Local 9
Government officials, The Urban Institute, 1973. 10
 - Federal Evaluation Policy, by Joseph S. Wholey et al, 11
The Urban Institute, 1973. 12
 - Program Analysis for State and Local Governments, The 13
Urban Institute, 1975. 14

The following references are listed under five major headings: 15

- I. The Government Audit Standards 16
- II. Efficiency and Program Results Audits for Government 17
- III. Operational and Management Auditing Concepts and 18
Techniques 19
- IV. Auditing Specific Program Areas 20
- V. Managing and Reporting on Efficiency and Program 21
Results Audits 22

The references under each of these major headings will be 23
divided into two groups: 1) complete books or publications, 24
and 2) references to specific articles in periodicals. Material 25
authored by the GAO or a GAO official is identified with an 26
asterisk. 27

I. Governmental Audit Standards

Books and Pamphlets

- * Standards for Audit of Governmental Organizations, Programs, Activities and Functions, GAO, 1972.

Suggested Guidelines for the Structure and Content of Audit Guides Prepared by Federal Agencies For Use by CPAs, AICPA, 1972.

Auditing Standards Established by the GAO: Their Meaning and Significance for CPAs, AICPA, 1973.

Federal Financial Management: Accounting and Auditing Practices by Cornelius E. Tierney and Robert D. Hoffman, AICPA, 1976.

Audits of State and Local Governmental Units, AICPA, 1974.

- * Auditors: Agents for Good Government, GAO, 1973.
- * Questions and Answers on the Standards for Audit, GAO, September 1974.

Articles

- * GAO Auditing in the Seventies by Elmer B. Staats, GAO Review, Spring 1972, p.1.
- * Operational Auditing and Standards for the Public Sector, by Ellsworth H. Morse, Jr., GAO Review, Winter 1973, p. 30.
- * The New Audit Standards and Internal Auditing by Mortimer A. Dittenhoffer, The Internal Auditor, January/February 1974, p. 19.
- * GAO Audit Standards: Development and Implementation, by Elmer B. Staats, Public Management, February 1974, p. 5.
- * Implementation of Standards for Governmental Audits by Donald L. Scantlebury, The Journal of Accountancy, May 1975, p. 34.

Expanding Practice to Include Federally Assisted Programs Requires an Added Library Shelf by Thomas R. Hanley, The Journal of Accountancy, July 1975, p. 37.

Operational Auditing Standards for Audits of Government Services by Michael H. Granof, The CPA Journal, December 1973, p. 1079.

Expanded Scope Audits - Untapped Opportunities?, by Steven C. Dilley, The CPA Journal, December 1975, p. 30.

II. Efficiency and Program Results Audits for Government

Books and Pamphlets

Measuring the Effectiveness of Basic Municipal Services, The Urban Institute and International City Management Association, February 1974.

Program Analysis for State and Local Governments, The Urban Institute, 1975.

Improving Productivity and Productivity Measurement in Local Governments, The National Commission on Productivity, June 1971.

Practical Program Evaluation for State and Local Government Officials, The Urban Institute, 1973.

Measuring Effectiveness of Municipal Services, Management Information Service, August 1970, International City Management Association.

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- * Measuring and Enhancing Productivity In The Federal Government; GAO/OMB/CSC, June 1973.
- * Case Studies in Federal Productivity Change FY 1967-1972, GAO/OMB/CSC, November 1973.
- * The Permanent Measurement System: Methods, Measures, Results; GAO/OMB/CSC, December 1973, Volume 1 and Volume 2.
- * Can Federal Productivity Be Measured?, GAO, 1975.
- * Using Auditing to Improve Efficiency & Economy, GAO, 1975.
- * How Auditors Develop Findings: Case Study, GAO, 1976.

An Introduction to Sample Surveys for Government Managers, The Urban Institute, 1970.

Obtaining Citizen Feedback: The Application of Citizen Surveys To Local Government; The Urban Institute, 1973.

Measuring Government Effectiveness, Government Finance, November, 1973 (entire issue).

Sophisticated Auditing Techniques in Federal, State and Local Government, Federal Government Accountants Association, Washington Chapter, 1973.

Federal Evaluation Policy by Joseph S. Whaley et al, The Urban Institute, 1970.

Family and Community Functioning, A Manual of Measurement for Social Work Practice and Policy, by Ludwig L. Geismar, Scarecrow Press, 1971.

Handbook for Auditors by James A. Coshin, McGraw-Hill Book Company, 1971.

The Performance Post Audit in State Government by Lennis M. Knighton, Graduate School of Business Administration, Michigan State University, 1967.

- * Tools and Techniques for Improving the Efficiency of Federal Automatic Data Processing Operations, GAO, June 1974.

Legislative Program Evaluation in The States - Four Case Studies by Mark L. Chadwin, Series on State Legislatures and Public Policy, Eagleton Institute of Politics, Rutgers University, August 1974.

Program Evaluation: Legislative Language and a User's Guide to Selected Sources, U.S. General Accounting Office, June 1973 (Updated in Congressional Research Support and Information Services, a Compendium of Materials, Joint Committee on Congressional Operations, May 3, 1974 pps. 297-352.

Student Financial Aid in Illinois: A Program Evaluation, Illinois Economic and Fiscal Commission, July 1974.

Evaluating Action Programs by Carol H. Weiss, Allyn and Bacon, Inc., 1972.

Assessing Program Effectiveness: A Rating System for Identifying Relative Project Success by Worth Bateman, The Urban Institute, 1968.

- * Evaluation and Analysis to Support Decision Making, GAO, December 1975 (Exposure Draft).

Articles

- * Management or Operational Auditing, by Elmer B. Staats, Comptroller General of the United States, The GAO Review, Winter 1972, p. 25.
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FOOTNOTES

Introduction

1. Throughout this publication the term CPA refers to a CPA firm or sole practitioner. The term practitioner refers to the individual professional personnel conducting the evaluation engagement.

Chapter 1

1. United States General Accounting Office, Standards for Audit of Governmental Organizations, Programs, Activities and Functions (1972), p. 2.
2. Ibid., p. 30.
3. Ibid., p. 11.
4. Questions and Answers on the Standards for Audit of Governmental Organizations, Programs, Activities and Functions, Auditing Standards Series Supplement No. 5, United States General Accounting Office, September 1974, p. 15.
5. United States General Accounting Office, Standards for Audit of Governmental Organizations, Programs, Activities and Functions (1972), p. 34.
6. Ibid., p. 12
7. Ibid., p. 13.
8. Ibid., pp. 13-14.
9. AICPA Statement on Auditing Standards No. 11, "Using the Work of a Specialist," December 1975, and MAS Guideline Series Exposure Draft "Guidelines for Cooperative Management Advisory Services Engagements," December 1975.
10. Operational auditing is a term generally used to refer to a method of reviewing or appraising the effectiveness or efficiency of various operations and operating procedures; a technique for assuring management that its aims are being carried out and identifying conditions that can be improved.

Chapter 2

None

Chapter 3

1. Cf. p. 22, Statements on Management Advisory Services, AICPA, 1974.
2. Auditing Standards Established by the GAO: Their Significance for CPAs, AICPA, 1973, p. 11.

Chapter 4

1. Audit Standards Supplement Series No. 6, Air Pollution Control Program, Sassafras County, Maryland, U.S. General Accounting Office, 1975, p. iii.

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1. The GAO Exposure Draft entitled Evaluation and Analysis to Support Decision Makers (December 1975) provides material on program assessment and assessing alternatives from the entity management's viewpoint.
2. Joseph S. Wholey et al., Federal Evaluation Policy, The Urban Institute, 1973, p. 23.
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4. International City Management Association, Management Information Service Report, Special Report, April 1976, Volume 8, Performance Audits in Local Governments--Benefits, Problems & Challenges.

Chapter 6

1. Monthly and Semi-Annual lists of GAO reports and other publications are available from the U.S. General Accounting Office, Washington, D.C. and are sent to those who request their name be added to the mailing list.
2. Adapted from the manual for an AICPA course entitled Operational Auditing - Basic.

Chapter 7

1. United States General Accounting Office, Standards for Audit of Governmental Organizations, Programs, Activities and Functions (1972). pp. 15-18.